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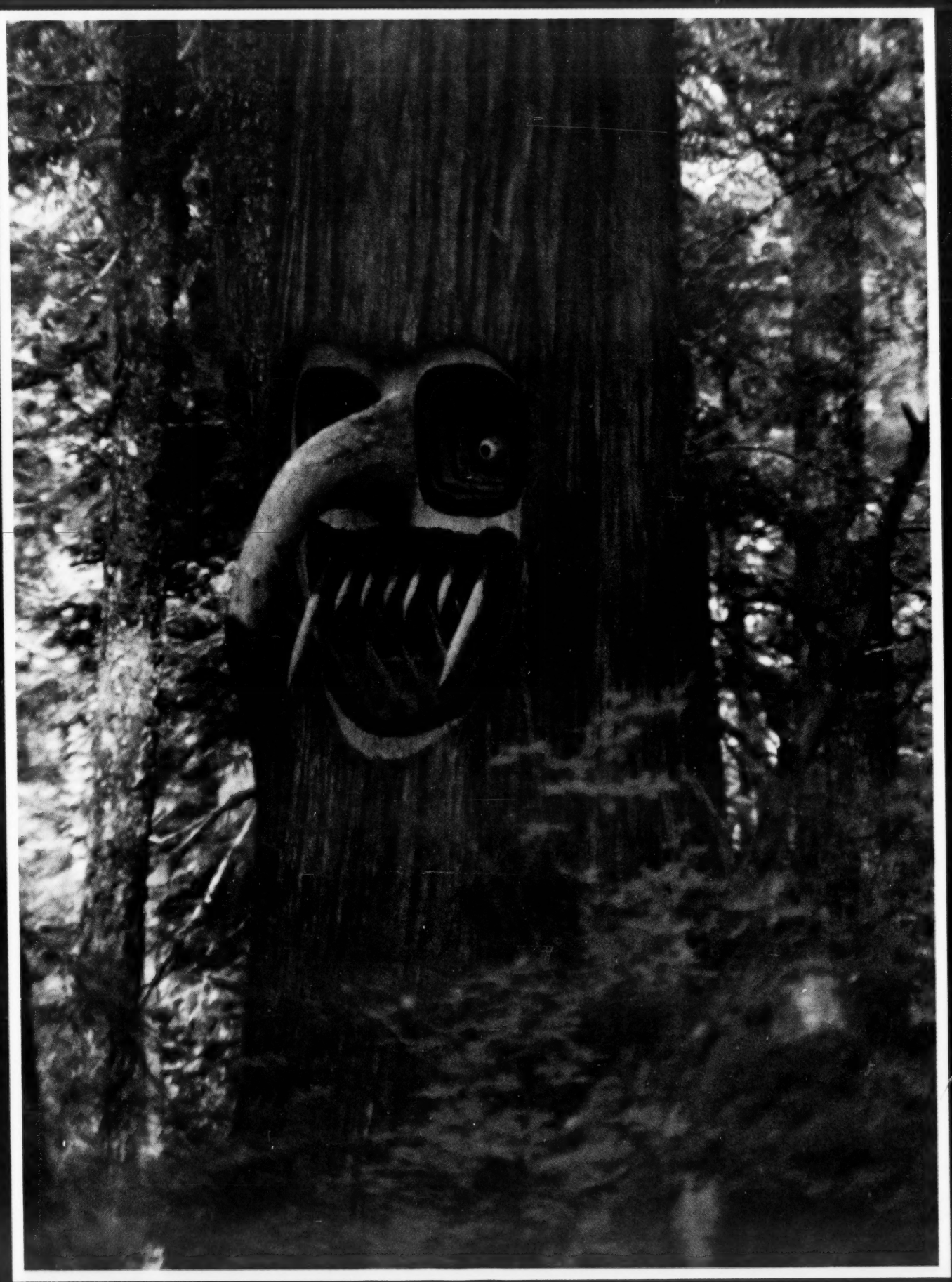

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No. 22 Summer 1979

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The COEVOLUTION Quarterly

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Cover

I first knew the artist when both of us were logging in Oregon in '57. Loren Copher at 20 was good enough to be the man running the yarder. Later he went from the gyppo outfit we worked for to one of the big lumber companies, cruised timber, and began to move up in the firm. In '72 he was riding in a spray helicopter when it crashed. He was seriously, permanently injured by the accident, particularly by prolonged exposure to the herbicide from the ruptured tanks. During the ensuing lawsuit Loren met and fell for an environmentalist named Allison. After the settlement they got married, got a farm in the woods, started rebuilding Loren's health. A year and a half later, I never learned why, Allison killed herself. Since then Loren spends a lot of time wandering in the woods, carving faces in the trees. They're all over the Northwest by now – seen only by timber cruisers, hikers off the beaten path, people taken by surprise by the faces. Loren seems fine. He hasn't remarried. He says all he's interested in is keeping people reminded of the difference between timber and trees.

Daniel Leen, author of **The Compleat Freighthopper's Manual**, *took the pictures in August, 1978 on Calvert Island, British Columbia. He has no idea who carved the face. The story above is made up. If anyone knows the real story, we'd love to hear it. The tree is a Western Red Cedar.*

–SB

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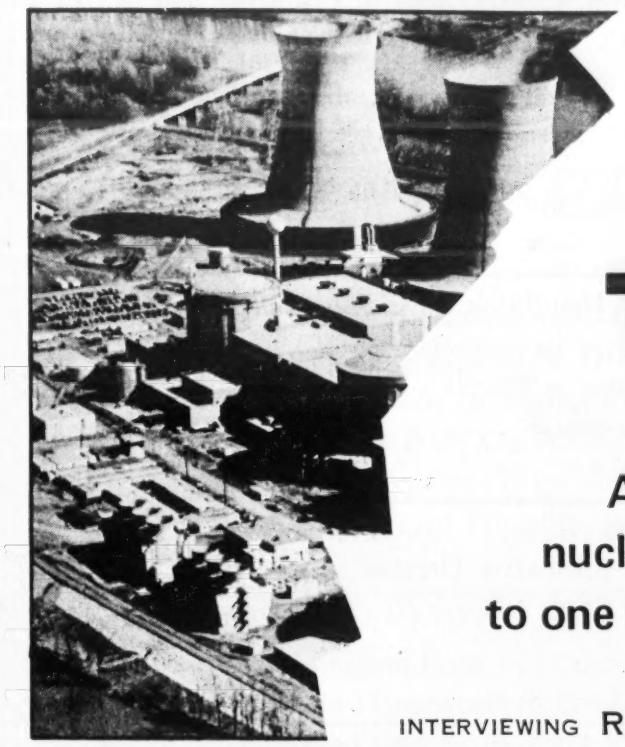


The Real News from Three Mile Island

At its present rate the U.S. will have one major nuclear accident every four years, increasing to one every two years.

INTERVIEWING **RUSSELL SCHWEICKART**

Former Astronaut (Apollo 9) Rusty Schweickart has been Science Advisor to California Governor Brown for over a year. In various discussions about nuclear energy that I've heard around the Governor's office, Rusty always had favorable things to say about nuclear, if only to balance the sometimes one-sided arguments by many of Brown's staff, including myself.

But on March 30 when the accident at the Three Mile Island nuclear power plant was just beginning, Schweickart urged the Governor to ask the Nuclear Regulatory Commission (NRC) to immediately shut down the Rancho Seco nuclear plant near Sacramento to determine if its similarity to the Three Mile Island plant might lead to similar problems – both plants were built by Babcock and Wilcox. Two days later, after further study, Brown made the request to the NRC and was refused. Two weeks after that the NRC reversed itself and ordered a precautionary shut down of all the Babcock and Wilcox plants, including Rancho Seco.

In the following weeks Schweickart and his assistant Dan Richard studied all the available technical information on Three Mile Island, including the entire transcript of the NRC deliberations during the crisis. Every time I chatted with Rusty he had some startling revelation or comment to make, so I pestered him for an interview and finally got this. We talked by phone while he was at his office Saturday morning May 12 in the middle of dealing with California's then-new gasoline shortage.

Some of his remarks may be dated by now, but several wild-sounding ones have since been confirmed by testimony in Washington, and it's likely that more will be confirmed in the coming months and years.

–SB

Stewart Brand: How close did we come to a meltdown at Three Mile Island?

Schweickart: Well, I suspect it's going to be a long time before we know. There's some facts that appear to be fairly well confirmed now. For example, something on the order of 30 - 40% of the zirconium cladding around the uranium fuel pellets was essentially destroyed in a reaction converting the zirconium into hydrogen gas and zirconium oxide.

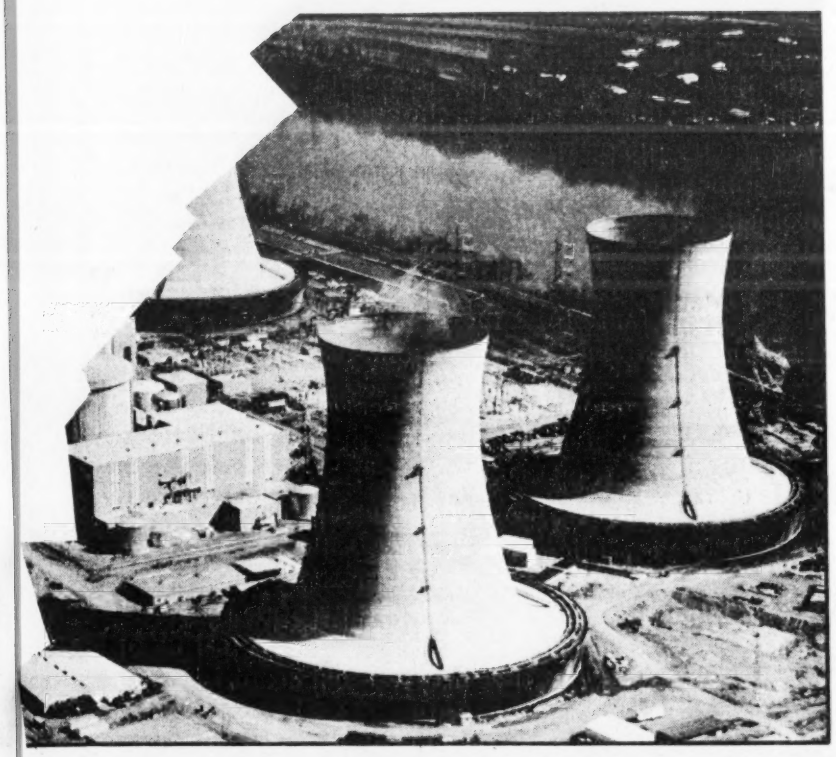
That's a reaction that takes place in the presence of water when the zirconium gets up somewhere over 2,000° F. The zirconium oxide then has crumbled and scattered itself down through the fuel elements, and presumably the uranium fuel pellets which it normally encases have then spilled out and down in through the core. The picture that was given by Harold Deonton, who is the chief of Nuclear Reactor Regulation, was that the core looks like an inverted pyramid of rubble with the peak of the pyramid being in the center of the core and down about five feet from the top. The fuel rods are twelve feet long or so. The NRC has estimated that the material is blocking about 93% of the normal circulation of water through the core.

Now that's a scene of considerable damage. The uranium pellets by the way probably did not melt: their melting temperature is higher, around 4,000° F. Nevertheless, the fuel pellets have fallen down into the remaining core, and at some point, if that were to have progressed much further, at some point you would have had enough concentration of those uranium pellets that there might have been a self-sustaining heat-generating reaction which would have continued.

What I just described in those last few words is a meltdown.

Knowing how close we came is going to depend on some detailed analysis of that core, but that may not be possible for over a year, by some official NRC estimates, and some people are guessing much longer than that.

SB: So there was a lot more damage to the core than was thought?



Associated Press

Schweickart: I think so. I suspect that some of the technical people who were right on the scene, such as Harold Denton and Edson Case, his deputy, and others from the NRC or perhaps some from the utility were probably more aware of it or were aware of it earlier than the general public, but I think Harold Denton's description of it recently in a congressional hearing was news to a lot of people who had been pooh-poohing the idea that there had been serious damage done.

SB: We don't know at this point how much further the core damage would have had to go to in fact go into a self-sustaining meltdown?

Schweickart: I suspect that no one really knows that, because I don't believe that that particular scenario of progressive destruction of the core from the top down toward the bottom as you boil away water – I don't believe that that scenario has ever been run out. Nor is it the kind of thing which would be terribly amenable to numerical analysis. Whether the fuel pellets have jammed part way down, whether they've all fallen through and are collected down at the bottom of the reactor vessel, is not all that well known. It's a little hard to say, Stewart, how much further it would have had to go in fact . . . before it would be self-sustaining.

SB: That's interesting – in itself I mean. Ignorances are always more interesting than knowledges. When you consider all of the bomb testing we've done, on the surface and underground testing, it seems peculiar that there's never been a closely monitored voluntary intentional meltdown to see what actually happens.* What I'm understanding now is that all of the figures and engineering about meltdowns is to a large degree speculative.

Schweickart: That's right. There's a great deal of controversy over what a meltdown scenario would look like. The fact that you would have high heat production is certainly very clear to everyone, but the sequence of events as that puddle of uranium begins melting and reacting internally, from that point on it becomes a matter of some speculation.

It's possible that it might melt through the reactor vessel itself and into the sump of the containment building below the reactor vessel, evaporate that water very rapidly, in fact flash it into steam, and then sit there possibly spreading around widely enough to distribute the heat into the 20-foot-thick concrete floor and essentially extinguish itself.

That's one end of the spectrum. On the other end there are a couple of scenarios. One is where there would be large volumes of water under the reactor vessel, which would have been the case at Three Mile Island, by the way. They estimate there is somewhere between five and six feet of water in that containment building. If it had melted down into that kind of thing, in all likelihood it would have created so much steam pressure that it would have blown the containment building apart, or at least ruptured it and released tremendous quantities of steam and radioactive materials into the surrounding countryside.

The other scenario assumes essentially a dry sump. The molten core comes down into the containment and basically burns its way right through the concrete base of the containment and down into the ground below, and as it goes hitting various strata of water and generating releases of radioactive steam and other radioactive byproducts up into the environment and into the water table. For those scenarios from there it depends a great deal on local topography, the distribution of population around the site, and the wind conditions how much havoc and exposure to the population would result.

SB: I'm just being amazed that a process which is so central to our civilization has never been tested in failure mode.

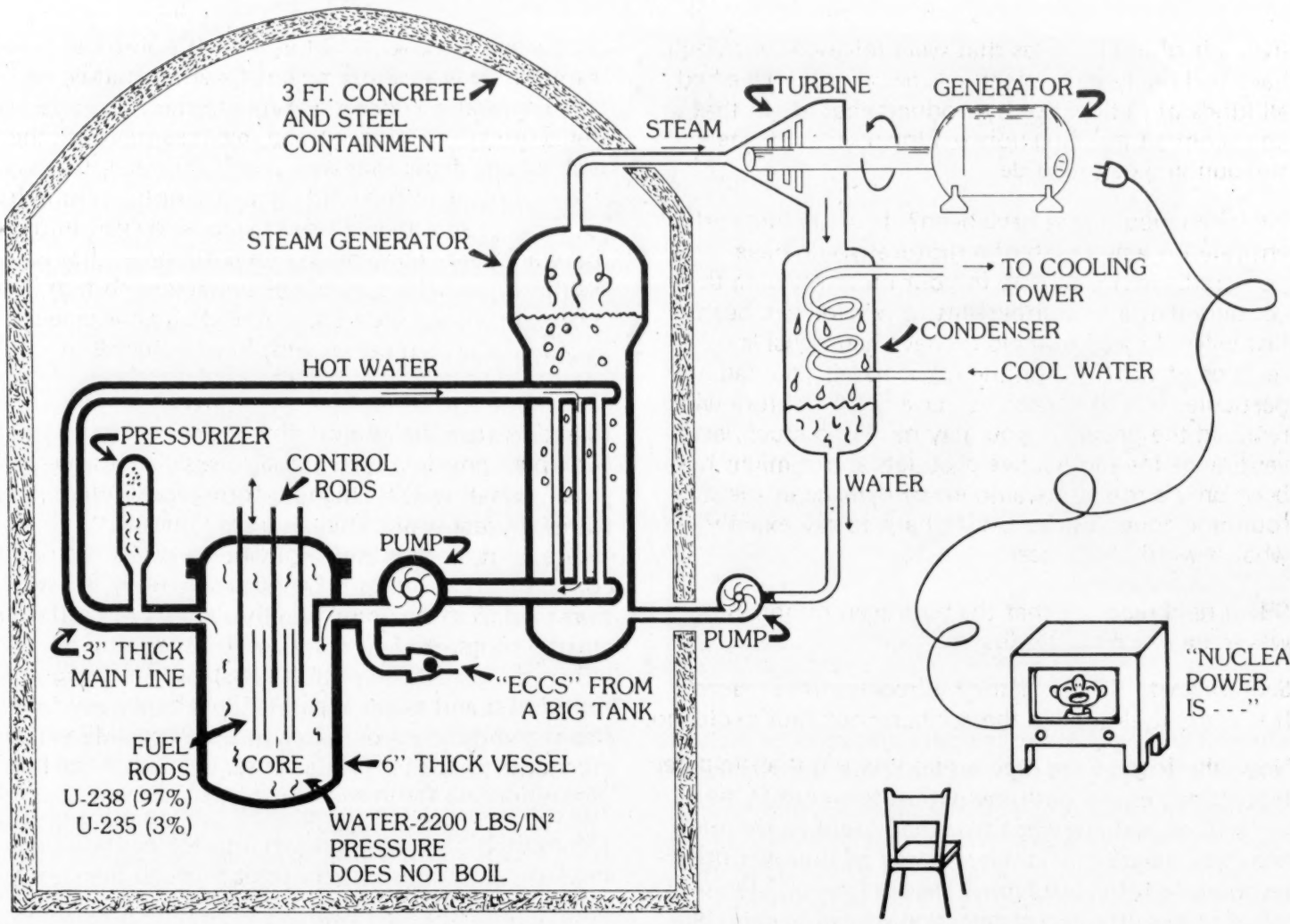
Schweickart: Yeah. But it's one of those failure modes which I don't believe you want to test. You're basically dealing in the meltdown situation with an uncontrolled nuclear reaction which I don't believe you really ever want to try out. The best you can do is to model it as well as you can, but that always requires simplifying assumptions in the mathematics, and there's always a question of how well the model represents the reality.

SB: So we almost had a meltdown. What else almost happened?

Schweickart: Well, there are two real situations which should be of concern to the general public surrounding a power plant. You worry about a breach of the containment building, and you worry about the meltdown of the core itself (which can result in breach of the containment also, but may not). Now, the containment is a massive concrete structure – 20-foot-thick flooring in some cases and 4-foot-thick walls to the thing, huge construction.

In the Three Mile Island accident, when the cooling water dropped below the top of the fuel rods, massive

*Atmospheric nuclear explosions 1945-73: total in the world, 341 (American 211). Underground or underwater: world total 506 (American, 349). From Walter C. Patterson, *Nuclear Power*, Penguin, 1976.



The Fight Over Nuclear Power, Fred Schmidt, David Bodansky, Albion. 1976.

Diagram of a pressurized water reactor like the one at Three Mile Island, whose core vessel wall is eight feet thick and containment wall four feet thick. There are three independent loops of water – the pressurized Reactor Loop, the Turbine Loop of steam that drives the generator and returns condensed water, and the Cooling Tower Loop.

At 4 a.m. March 28 the feedwater flow in the Turbine Loop was interrupted and the auxiliary feedwater system failed, thanks to valves left closed. Lack of steam shut off the turbines and lack of flow allowed the Reactor Loop to overheat and overpressurize with a rapidity characteristic of B & W reactors. The reactor automatically scrammed, shut down, but heat and pressure continued to build until a pressure relief valve opened, venting water as well as steam, and stuck open. In automatic response to low pressure in the pressurizer the Emergency Core Cooling System (ECCS) kicked in and then was cut off manually due to a false "full" indication from the pressurizer. At this point the core was exposed, in the high heat the zirconium cladding of the fuel rods burned (generating hydrogen), and severe core damage resulted. As steam and hydrogen gas circulated into the huge Reactor Loop pumps, they began vibrating violently and were manually shut off.

At 2 p.m. hydrogen which had leaked from the reactor through the stuck relief valve into the containment exploded.

volumes of hydrogen and steam were generated and began to circulate up into the pumps and the steam generators and things of that kind. And as it began to get into the rest of the plumbing system of the primary coolant, it also found its way out into the containment, outside of the reactor vessel.

At some point ten hours or so into the accident the hydrogen in the containment ignited.

I don't know what the ignition source was, but there's lots of electrical equipment in there of all kinds – valves that have relays on them and motors and all sorts of things. Of course at that point it was not recognized that this hydrogen was even being generated, so no one was taking any steps to prevent it or reduce it or stop it.

The ignition of the hydrogen in the containment created an explosion or a "rapid burn" (by rapid I mean a few milliseconds) which increased the pressure inside the containment building to 28 pounds per square inch (psi) – that's 28 psi over normal atmospheric pressure of 15 psi, so it was a serious explosion.

Luckily it only reached 28 psi, because the containment building is designed for about 55 pounds psi overpressure. Now, on top of that of course you have a factor of safety built into it so it may have taken greater pressure, perhaps as much as 100 psi, before you actually had rupturing or major fracturing of the containment itself, but on the other hand there are lots of seals around pipes and tubing and things of that kind that may have blown out at lower pressures.

The point is that if that hydrogen production had gone just a little bit longer, or a little more of it had flowed out into the containment at the time that that ignition took place, we might have had a much much more serious accident on our hands, because if the containment had ruptured, then you would have had direct release not just of the xenon and radon and a

little bit of iodine gases that were released, but you'd have had really bad actors – I mean you'd have had all kinds of radioactive byproducts that are in that containment building now – blown out into the surrounding countryside.

How bad would that have been? It would depend entirely on how much of a rupture would have occurred. If you picture in your mind blowing the containment into smithereens, it would have been just wild. I mean you would have had massive releases of stuff. If, on the other hand, you had a particular seal that went out or a small fracture which released the pressure, you may have had much less venting of the radioactive products and it might have been only a moderate amount of damage in the surrounding countryside. So it's hard to say exactly what it would have been.

SB: I read recently that the hydrogen bubble never was in danger of exploding.

Schweickart: That was the hydrogen in the reactor. It was the hydrogen in the containment that exploded.

Now, the frightening fact is that it was not anticipated, that there was no instrumentation to monitor the buildup of hydrogen in the containment so that perhaps warning could have been given to the authorities responsible for evacuation and protection of the public. As a result the explosion was unanticipated, was a complete surprise, and was not even understood or at least reported until two days later.

That is an incredible condemnation of the design and instrumentation of these power plants in terms of anybody being able to protect the surrounding public. It's not that you have villainy here. You just have . . . lack of foresight in the design process. I mean it was not expected, nobody designed for it, nobody really thought about it. They didn't spend the money to put the instrumentation in, so you don't have the instrumentation today that people would need to be able to provide adequate warning in case hydrogen was building up again, if this should happen right now in any of these other B & W (Babcock and Wilcox) reactors. It may be different for other reactors, but I doubt it.

SB: Jesus Christ. Is it your sense that the hydrogen explosion is not widely known or thought about or considered in all the analysis and recriminations that's going on over Three Mile Island? Why not?

Schweickart: It's a mystery to me. It's possible that the answer is quite simple, and that somehow in spite of all of the material that I have had access to, have collected here in my files and have read long into the night, night after night, that somehow I've missed the simple answer to that problem. On the other hand it may be that people just have not really seriously addressed a serious issue.

You see, two things need to happen in response to Three Mile Island, but only one of the things is clearly happening, and it's necessary but not sufficient. It is necessary to do everything that one can to prevent the occurrence of events such as this accident at Three Mile Island or any other nuclear plant. I don't in any way want to belittle that effort. It's absolutely necessary, but it is absolutely insufficient. That is, no matter what one does in trying to minimize the occurrence of such accidents, one must assume that there will be accidents that we haven't foreseen, that we haven't planned for, that we could not preclude from occurring, and then the next step is to ensure that you have adequate control instrumentation – that is, visibility into the guts of the systems – so that if an accident – I shouldn't say if – <u>when</u> an accident occurs, you then can at least have a chance of controlling it.

That's a standard philosophy in any highly interactive complex physical system that deals with danger to life – whether it's a high-performance airplane, or a large passenger airplane, or a spaceship with astronauts in it, or anything else where you have a number of interacting and interwoven and interleafed systems with an accident potential – you need to do both of those things. But what has been happening since Three Mile Island is that the first issue is being addressed and a number of actions have been taken to minimize the recurrence of the Three Mile Island scenario and other similar ones, but very little has been done so far in taking care of the second action, to ensure that the operators of the systems have improved instrumentation, control capability, visibility into the internal workings of the system, and the kind of training which is needed to respond not to anticipated events but to unanticipated events.

That's the part that bothers me, looking at it out of my background at this point.

SB: Are you saying our nuclear reactor safety procedures don't compare to the way NASA did things in the space program?

Schweickart: I don't want to hold NASA up as the great standard, but it certainly dealt very seriously with that latter part (handling the unforeseen) of the design philosophy. Only something on the order of 20 percent or so of the time that we spent in the simulators and trainers were devoted to learning how to fly the mission in situations where everything was working correctly. And that's really a very complex process, if you look at monitoring and controlling of launch, the rendezvous process, landing on the Moon, Earth reentry – they're very, very complex procedural events. Nevertheless, that was only 20 percent of our time. About 80 percent of the time what you're dealing with is how do you still live through a lunar landing when the primary computer fails? And not only the primary computer, but when you get done solving that one, then you find out that the primary pump in the suit-cooling loop went out and that the lithium hydroxide canister failed and needs changing or that the fuel indicator on the right fuel tank is acting erratically, your rendezvous radar is giving you glitches, and a drive motor failed on something . . .

SB: Was the simulator complex enough to link the problems, so that actions you took to solve one might exacerbate some other problem?

Schweickart: Yes. There are two sort of fundamentally different types of trainers or simulators. One is

Astronaut Schweickart was the first to test the independent space suit (the Portable Life Support System) in space. Beforehand he tested it exhaustively on Earth, as here, in a vacuum chamber simulating 200,000 feet altitude. That was in 1968. It is interesting to compare NASA's safety procedures (then) and the nuclear industry's (still, ten years later), and note that NASA endangered only a few astronauts and some national prestige whereas nuclear plants put hundreds of thousands of lives at risk as well as the whole national economy.

called an open-loop system and the other is a closed-loop system. If you had an open-loop simulator for the Three Mile Island accident, and knew in detail the sequence of events that happened we could go to a room which looks exactly like the TMI control room and put people in there, and make all the displays do exactly the same thing that occurred at Three Mile Island. So the operators will see all these things happening and they can go over what their actions should be. They're learning to take an action in certain circumstances, but the action they take doesn't in fact really change what's coming next in the simulator.

That's the open-loop situation. The closed-loop situation is a much more difficult thing to do, because you have to have detailed computer modeling of each of the systems in the reactor and supporting the reactor, and the models of the systems have to interact inside the computer in the same way that they would in the real world.

That's exactly what we did in NASA with the higher-level simulators. The mission simulator not only looked exactly like the spacecraft that you flew (except that it couldn't generate weightlessness), when you looked out the window, instead of seeing the real Earth below you, you saw a visual image of it in black and white through a video projector. As you threw a switch the computer began to do its thing and it would totally model the response of, say, the cryogenic oxygen system, and if you turned on a heater and shut off a fan, the temperature indication would respond properly. The whole behavior of the simulator duplicated the real world to the extent that it could be done, to the extent that it was understood, with very little barring of expense. That makes a tremendous difference. Something which is not generally appreciated is that there isn't some body of people — the designers, the builders, whoever — who understand the behavior and interaction of these systems, for example on a spacecraft, at the time that they're designed or built. Most of the learning, most of the understanding especially of the interactions of the complex systems is gotten either from real operation or, if you can afford that luxury, in these closed-loop relatively sophisticated simulators.

Characteristically here's what would happen. One of the people out on the control panel would write into a computer something which would cause, let's say, an occasional break lock on a radar system which is measuring range to the vehicle you want to rendezvous with. *[On Apollo 9 one of Schweickart's tasks was to take the lunar lander, fly it 200 miles away from the command module, find his way back, and dock.]* Now first of course the challenge is to see that that's happening. In some cases the failure may be subtle enough that it doesn't trigger any alarm, but if you understand the system you begin to see things coming up on the range indications which are not matching what ought to be happening. So now you begin to do some diagnostics by going into the computer and calling out some raw data and taking a look at that instead of the filtered end product.

Well, you look at the input data and you see something coming through there which is looking really squirrelly. I mean, it goes along with a nice number for a while — it says you're 150 miles away — and the next instant it says you're 10 miles away, and then 20 seconds later it bounces back up to 150 and stays there for two minutes and then drops back down again. Meanwhile the computer output is giving you a filtered average of 130 miles. Well, you've diagnosed the problem because you could get at the raw data and you say, "My God, I've got to complete the rendezvous with the Command Module because I don't have a heat shield, and it does, and I've got to get back there if I'm going to make it home alive." So I take some corrective actions. To do that I have to go in and monkey with the rendezvous program of the computer; I take command manually of something which normally would be done automatically. Let's say we've designed it in such a way that we've provided the operator the ability to do something like that — that in itself is a statement about design philosophy.

Here's where the thing gets interesting. Let's say, fine, I start smoothing out the range and range-rate information for the rendezvous problem, and I can begin to get reasonable solutions again to the maneuvers I have to make. But unknown to me, and to anybody, that action that I take happens to have a very subtle effect that no one foresaw on the alignment program for my gyroscopes which give me my basic orientation. Well, half an hour later, when I go to align my inertial reference system by taking a sighting on the stars, I find out that, boy, I'm really getting garbage. All of a sudden it says that my inertial reference is 20° off, it sounds an alarm as I go through the program and it says, "Can't compute." It's screwed up my navigational system, I blow my rendezvous, and I die.

I get resurrected immediately because the simulation comes to an end, and we say, "Hmmm, we got a little challenge here." So for the next two days everybody in the system is working out how we get around this problem. That's a kind of closed-loop simulation which I think is necessary if you're really going to be able to anticipate many of these highly interactive and remote systems. It's not in any sense like driving a car and feeling a shimmy in the wheel. It all comes through pressure indicators and temperature indicators and trend needles and digital readouts and things of that kind.

SB: I remember right after Three Mile Island, some congressmen said that the problem there was that the operator overrode the automatic controls and we've got to have written in the understanding that the operator shall not override the automatic controls. What's your view on that?

Schweickart: Well, from all that I've seen – and this may be proven wrong later – everything the operators did at Three Mile Island was based on a legitimate indication, and in all likelihood most of the other operators in the country would have done the same thing given the same situation and the same indications.

Let me give you some examples. At one point after the emergency core cooling system had been triggered automatically, the operators turned off the high-pressure injection pumps. That action was based on the indications that they had from a device called the pressurizer, which told them that not only was there enough water in the system, but in fact it was overflowing. By that indication, the high-pressure injectors were forcing a release valve open and dumping water out into the containment because they were putting more water than was needed into the system.

What caused that misleading indication was that by this time the pressure had dropped inside the reactor to the point where it was boiling the water in the cooling system (which should never boil in a pressurized water reactor). The cooling water was boiling away, creating copious quantities of steam, and the steam was forcing the water out through this indicator, indicating that it was full, so they shut off the injector pumps.

That action then aggravated the problem, because now there was no new water coming into the system and there was still water leaving the system. Now, is that operator error? Yeah, sure it's operator error, in one way. In another way, they were totally misled by the design of the system. They had no direct indication of the actual water level in the reactor vessel.

All right, as soon as they shut off that water, then it started getting even hotter in there and generating even more steam, and that's the point the water level went so low that the core overheated and generated all this hydrogen. Then the hydrogen and the steam started going back around into these <u>huge</u> pumps in the reactor coolant system. They're monster pumps, rotating at very high velocities, designed to pump liquid, and when they began sucking in large gas bubbles, they started vibrating like mad.

Now, when you have rotating machinery that vibrates like that, it vibrates the world around you! I mean that is one helluva shake. So not only did the operators shut off the cooling water, but then in order to keep the pumps from shaking themselves apart, they shut off the circulation pumps. You understand, all this was going on at 4, 5, 6 o'clock in the morning.

So instead of just saying that it's operator error, we should be asking why did the operators do erroneous things? Why did they take erroneous actions? Were they inadequately trained? Are they being misled by instrumentation? Is the design of the reactor system such that in fact it is overly sensitive to certain things? And in fact, as you look at it, all of those appear to be the case. And some of them you can't deal with right away. Then you're faced with the question of, okay, do you or don't you shut down the plant while you deal with them?

Our feeling was, yes, given the evidence that we had, that strictly procedural recommendations, although well intentioned, were inadequate to insure safety for the general public as long as those more serious corrective actions were not taken. I think basically it was with that same logic that the NRC finally agreed the plant should be shut down and some corrective action taken.

SB: I understand that in the course of deciding all that you did some refiguring of the odds concerning nuclear accidents.

Schweickart: Well, the probability game is something which I don't have a great deal of confidence in. You're subject to error on both ends. On the one hand you have the kind of thing done in the Rasmussen reactor safety study, where you make as intelligent a guess as you can based on the probability of failure of little bits and pieces all through the system. You look at the way they interact and you come up with a failure rate for each action in a scenario. When you look at that in detail you realize that it is a game of guesswork.

You're talking about failure rates of systems which may fail one time every 1,000 hours of operation, or 10,000 hours of operation. Well, how many have they really run for 10,000 hours yet? If you're talking about, let's say, leaving valves closed, you're not talking about the failure of some mechanical system, you're talking about the failure of a human system. What is the probability that the operator will leave a valve the way it's not supposed to be? Not only does the maintenance guy have to fail, but his supervisor has to fail, and the inspector has to fail because he doesn't catch it either. Okay, say the maintenance guy misses it once every 1,000 times he does the check; his supervisor's a little better so you say once every 10,000 times he doesn't catch it; and the inspector is super, so once every 100,000 times he doesn't catch it. You add them all together, and "once every 10 million times," that's the problem. You try to quantify all this stuff in an esoteric event tree, so you come out with a major accident – the so-called Class 9 accident, a core melt or major radioactivity release – maybe once every billion years or whatever the number is. It's a big number. That's on the one hand.

Now you go the other way. Now you say, all right, let's just look at the 500 reactor years of experience we've had.

SB: In America?

Schweickart: In America. Five hundred reactor years of experience, and we've got . . . let's eliminate all the riffraff, all the little accidents that happened but were controlled or stopped or interrupted or taken care of before they developed – and let's just take the biggies. Well, we can reduce it right down to two: the fire at Brown's Ferry and Three Mile Island. So in 500 reactor years of experience you've got two big problems, ones where you skirted some unknown

but narrow distance from a major disaster. You know you better be designing your emergency plans and all your decisions on that kind of a base, because those are the ones that you don't want to happen.

Well, if you got two of those in 500 reactor years, that says you're gonna have one accident of that magnitude every 250 reactor years. Let's see, every reactor is going to operate say 30 years, so you got 30 reactor years for each one, and if you get one major failure in every 250 reactor years you got one chance in eight of a Three Mile Island type accident.

SB: Per reactor?

Schweickart: Per reactor over its lifetime.

SB: How many reactors in the country?

Schweickart: We got 70 of them now. Say it was just 60. That says you're gonna have eight incidents of this kind in the lifetime of those reactors – 30 or 40 years. So, in essence, if we build no more reactors, once every four years we're gonna have a biggie like Three Mile Island. That's a pretty generous estimate, in a sense, because our record is not quite that good, and as the number of reactors builds up, then accidents get more and more probable.

SB: How many reactors are in the tube now?

Schweickart: Well, 92 are somewhere in construction or ready to come on line. Add them to the 70 we got and that's 162 reactors. If you have a major accident every 250 reactor years, that means a major accident in the U.S. every two years, or more often than that.*

Well, you look at that and you say, boyoboy, that is really bad news. But you got a statistical base of two. That's a lousy base. I mean, I can flip a coin and I can get two heads and say, "Huh, heads come up all the time." So a statistical base of two is not a very good one on which to base your decisions. On the other hand, it's real, and it's hard to argue against it.

You could say, "But each time we have one of these things we learn a tremendous amount." Except if you look at the record, it's not clear exactly how much we do learn. I'll give you a good example with these B & W reactors. It's well known that the design of the B & W reactors is very sensitive to these feedwater transients. That's the historical record – about once a year one of these major feedwater things occurs in a B & W reactor. What happens is the reactor keeps putting out energy at a tremendous rate, but with the feedwater system interrupted there's nowhere for that heat to go, and the coolant expands in the primary coolant system and fills up that pressurizer, and it pops a relief valve at the top of the pressurizer. In the nine B & W reactors presently operating that electromatic relief valve has had to open 150 times because of overpressurization due to feedwater transients.

In four of those 150 times it was activated, that relief valve failed to close. And that's exactly what happened at Three Mile Island.

But even when the relief valve works okay, there's a whole history of the pressurizer first overfilling and then emptying in an over-reaction the other way. And when it drops out the bottom, the operator has no direct indication of water level in the reactor. All he has is the water level in the pressurizer – it's an indirect reading at best, and in these transient conditions in many cases it's almost meaningless to the guy.

All right, are we learning from experience? You know, the design hasn't changed.

SB: Good God.

Schweickart: Even now it hasn't changed. B & W's doing a lot of work, and they're coming up with some design changes, but there's not a lot of record of responsiveness to obvious design weaknesses which would lead you to believe that this industry or that the regulators or the operators of the plants are in fact learning from experience in such a way that one should put much confidence in it.

SB: How do you account for that failure?

Schweickart: I don't know. I would say it's the marketplace.

SB: How do you mean?

Schweickart: In most cases you're dealing with private utilities. In few cases like here in Sacramento you're dealing with a municipal utility, but in all cases, municipal or private, people are concerned about the rates they have to pay for electricity, so there's always a legitimate desire to keep the rates as low as possible. And when a nuclear plant is working correctly, it's beautiful. No question about it. In terms of generating electricity, it's the cleanest thing going. But, both environmentally and in terms of the way the systems work, when they start going bad, watch out.

I don't know for a fact, but my guess is that a B & W nuclear plant when it's working right is more cost effective than its competitors. It's a higher performance system. But it's also more sensitive to various transients and failures. Here you begin to trade off the nominal performance of the system with its responsiveness under challenge, under stress. Well, it's going to cost something to modify that design – it may cost quite a bit if you're going to redo the whole design – so there's a natural reluctance, because it means you're going to have to shut down the plants for a long period of time, and install major pieces of equipment. All of those things eventually come out of your pocket and my pocket. The manufacturer's plant doesn't sell as well because it now has become more expensive than it used to be. Nuclear power in general doesn't look quite as good, because the costs have gone up, and part of the argument has been that it's going to be very cheap.

If you're in a profit-making business, you're always trying to get away with the best product for the least cost – that's the famous bottom line. But the

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*A table compiled in 1975 showed 55 U.S. reactors operating, 63 under construction, 99 on order, 17 intended – total 234. For the *world* in 1975 it was 102 operating, 85 under construction, 70 on order, 169 planned – total 426. From Sheldon Novick, *The Electric War*, Sierra Club, 1976.

question is, where is the line that says adequate for safety of the public?

SB: Rusty, what I keep hearing as you tell me all this, what seems to explain all the peculiar behavior around nuclear, is that the culture is in a state of denial about nuclear energy. We'll do anything to avoid thinking it all the way through. How good are evacuation plans around nuclear plants?

Schweickart: It's really hard to say. I don't have any first-hand experience in evacuations, but in general if I wanted to conduct an orderly evacuation, I would go to the Army or some situation where you have a very clear hierarchical highly disciplined command structure, and there are well-established evacuation plans and people have drilled on them and everybody knows exactly what they're going to do, and if they don't do it, they're courtmartialed. Then, boy, there's no question of the way it goes.

In California or any of the states you've got exactly the opposite situation. Instead of a clear hierarchy you've got the Nuclear Regulatory Commission, the utilities, the manufacturers of the equipment, the state, the governor, his staff, emergency services people, the county supervisors, county emergency director, and then you've got the individual independent citizen who doesn't have to jump when somebody says jump. And may very well not.

So by nature it's gonna be a mess. Now, what you try to do is take the elements of the system which are to some extent hierarchical, and you try to exercise them. But you can't exercise them at a level where it disrupts the general social fabric. I mean, we will likely not be able to call for a practice weekend and in fact have people move out of their homes and drive forty miles away or get on busses and disrupt their life and leave their cattle or their ailing aunt or whatever would be necessary to really practice it.

SB: So the people who should have nuclear plants is military bases?

Schweickart: Well, Alvin Weinberg, in looking at this problem, and he's a bascially pro-nuclear person, has suggested something effectively like that. He says that rather than having nuclear power plants dispersed all around the country near the places where you use the power, what you do is put many nuclear plants at a few locations. You condemn the land around them. If you're going to reprocess, you put the reprocessing plants there. If you're going to store fuel, you put the storage there. You minimize the transportation risk, you minimize the security risk by having a single highly secure area, and you minimize the risk to the public by moving them out, and you have a highly disciplined situation in these islands.

SB: How practical is that, given the next 92 plants?

Schweickart: Well, if we're going to continue with nuclear power, it may not be all that impractical, because I think that the public concern over nuclear power is very large and growing. The problems associated with siting new plants are tremendous – very very costly. So one could argue that if you locate a few sites and then build everything you need on them, you're going to be a lot better off. On the other hand, Stewart, what you end up with is essentially establishing a nuclear priesthood. You're going to have people living on the site who develop a fortress mentality kind of thing. You could end up in a very tough situation in terms of an isolated subculture within our society who must of necessity be suspicious of everybody else, supplying what is viewed by the rest of us as an essential to our way of life, which is electrical power.

SB: So you get a nuclear OPEC.

Schweickart: Right.

SB: Seems like it would also be a tempting military target.

Schweickart: Sure, both military and in terms of terrorism or sabotage.

SB: Is one of the worries about doing good evacuation planning that the better your evacuation planning is, the higher the fear level you generate in the folks who may just say, "If the danger's so real that we have to practice evacuating, we don't want nuclear after all?"

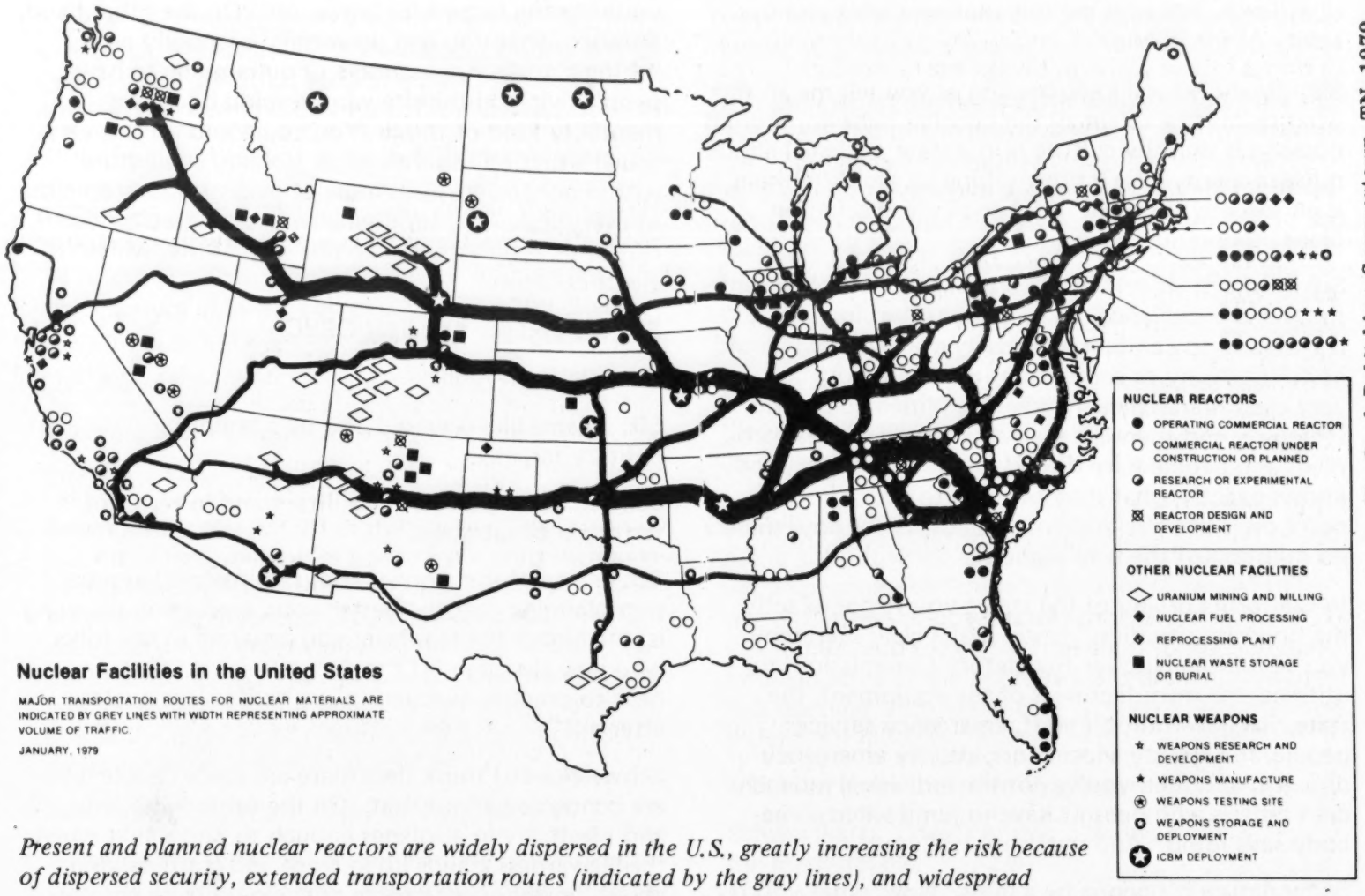
Schweickart: I think that there are some people who are concerned about that. On the other hand, you and I both fly in airplanes enough to know that when the stewardess stands up in front and starts talking about "in the event of loss of cabin pressure an oxygen mask will drop down in front of you . . ." what you wish is she'd shut up. You've heard it so much that it doesn't instill fear. So, number one, I don't think it's going to generate a long-term negative fear reaction, and number two, whether it does or not I think it's an obligation, it's something that we have to do.

SB: I'm still trying to see what are the generic problems here. My sense is when something becomes controversial, whether it's Vietnam or prohibition or nuclear energy, then the people trying to keep it happening prevent themselves from being cautious or even rational because that might give encouragement to their opponents. If I'm pro-nuclear and I say, "Look, we've got to have good instrumentation and evacuation plans for meltdowns," then I'm admitting that they're possible and then, my God, the flakes out there are going to say, "See, even the atomic energy guys admit that this bad stuff is going to happen." And so, to avoid giving their enemies information, they wind up giving their enemies events. Such as Three Mile Island.

Schweickart: And you realize that the victim of that tug-of-war is the general public.

SB: On the other hand, if you didn't have the opponents saying, "Just a damn minute, what are the facts here?" . . . I mean, you pointed out that the market forces go for getting it cheap and quick, but . . .

Schweickart: Look, Stewart, you know me well enough to know that I believe somewhere way down inside that the truth will out. I don't know exactly what the truth is, but I have a very strong faith that



Shutdown, The Book Publishing, Summertown, TN, 1979.

Present and planned nuclear reactors are widely dispersed in the U.S., greatly increasing the risk because of dispersed security, extended transportation routes (indicated by the gray lines), and widespread exposure to the populace when accidents occur. Risk could be reduced by locating all nuclear activity in high-security nuclear islands, but Schweickart worries that this might lead to a dangerous nuclear "priesthood" in our society.

it will out. If the potential for accidents exists, we're going to have them, and we're going to have them at a rate which is dependent upon how responsible we are in the plant design, in the plant operation, in the preparation for those accidents.

In somewhat the same way, the economics will eventually come clear. I'm not just talking about the economics of increased preparedness, but also the cost of waste disposal, which we have not dealt adequately with, costs for dealing with terrorism, and for the ultimate price that we may be paying in terms of nuclear proliferation – conversion into weapons, either by terrorists or by other nations who will turn their nuclear wastes from their civil reactors into bombs which at one point or another they may use.

There is a price for each of those things and the accounting will eventually be made. My own philosophy says let's account for those things now, to the extent that we can. Let's not avoid them with the hope that they're going to reduce or go away or evaporate.

SB: What would happen if we said "No Nukes Now." By Christmas 1979, all American nuclear reactors shut down?

Schweickart: If I were going to say that, I would not want to be where someone from Chicago could get to me. Or anyone from the Northeast. Because you've got regions in the country where it isn't a question of a brownout or something. You're talking about total disruption of the society. So you better have an alternative when you say that. Our generation has forgotten how bad coal is. It would be lovely to have solar come on line by next Christmas, but you and I both know that although solar has a lot of attractive aspects, we're not going to produce electricity with solar by next December on any kind of an economic basis.

SB: If we became a lot more dependent suddenly on Mideast oil, what would happen?

Schweickart: Well, you can write scenarios all the way from the benefits of increasing interdependence as we all integrate into the larger One of the Eastern mind *[unspiritual laugh]*, to the opposite scenario which says if we become more dependent on Mideast oil we invite terrorist activity or aggression in Saudi Arabia or elsewhere in order to totally disrupt and destroy the U.S. society. There's no question, it seems to me, that we do make ourselves more vulnerable to a war situation.

SB: There's a path by which a no-nuclear-energy-now policy could lead to a nuclear war?

Schweickart: Sure. No question. Now, hopefully, the probability of that is low, but now we're back into the Rasmussen game.

SB: In the last month or so you've been getting an education on nuclear energy in the U.S. How's that affecting you? Are you coming to any kind of conclusions?

Schweickart: Well, I am the accumulation of my

experience, and a lot of that experience comes out of a technical background, and so my general orientation to things is that you don't make hasty decisions. You don't jump to conclusions, you don't get swayed by emotional things – you consider them, but you try to consider them in some rational fashion and put a weighting factor on them and add them into all the rest of the stuff.

So I find myself, as does everyone else, on a set of scales, you know. I guess, to answer your question, I find myself with the scale gradually moving in the direction against continuing use and development of nuclear power.

SB: Somewhere between "all nukes" and "no nukes," you're in a position that might be called "fewer nukes?"

Schweickart: That's right. Moving toward elimination of them in some way, but not in a precipitous irresponsible way

SB: Another question. What's your view on the actual releases of radioactivity from Three Mile Island? It's in the press a lot.

Schweickart: I think that's a total barking up a wrong tree. We're talking about a population of two million people that might have been affected, something like that, and watching them over twenty or thirty years. It's been argued that there may be one or two additional cancer deaths because of the radiation released. Let's say that's wrong by a factor of five or even ten – you may be talking abot ten or twenty additional cancers in that population. Well, that's reprehensible. On the other hand, I've got to weigh that against the natural background. In that same population, over twenty or thirty years, there'll be 350,000 cancer deaths from other causes. The real issue with Three Mile Island is not what actually happened, but what we came so close to having happen.

SB: it wasn't a radioactivity release, it was an information release?

Schweickart: It was an alarm sounding. Stewart, let me read you a thing here. It's part of some testimony I gave before Mel Levine's energy subcommittee about Three Mile Island and California's emergency preparedness.

"When we talk about nuclear energy we're talking about extreme concentrations of power. When we proud but fallible human beings presume to tap and control this energy, we assume an awesome responsibility – the construction and operation of physical and organizational systems whose performance and wisdom must match the power we dare to manipulate.

"Ultimately this is the question of nuclear energy, whether weapons or power plants. Can we human beings, of limited wisdom and foresight, so organize to control these extreme concentrations of power that our occasional but inevitable mistakes will be acceptable to the society at large?"

SB: It sounds to me that the more socialist you are the better chance you have to get along with nuclear energy. You don't have the private companies going for the cheapest fastest, you have the government, like the government that made NASA work, right? You've got hierarchical control where you can run your evacuations whether people want them or not. You've got the total police coverage that makes terrorism a lot more difficult. Seems to me that strong socialism or communism and nuclear energy are made for each other.

Schweickart: That's the question. Should our society accept that kind of a hierarchy to handle these extreme concentrations of power?

SB: I can see it sneaking up on us. Suppose we get the meltdown in five years. The argument is going to be, on the one hand, shut 'em down, and on the other hand, we can't shut 'em down, therefore nationalize 'em. And by then presumably there'll be so much other weirdness with oil and so on that they'll be talking about, we've got to nationalize the whole energy bugger. If the problems increase and are continually blamed on the market, the private sector, people will say, well, the country's gotta run it. There'll be a few folks like me saying, "You mean like Amtrak?" and other folks saying "Oh great, you mean like NASA?"

Do you have any idea of which way a nationlized energy industry might go – Amtrak or NASA?

Schweickart: Well, what's the difference between Amtrak and NASA? Amtrak supposedly is a participator sport, and NASA is a spectator sport. With spectator sports maybe you don't care.

SB: Energy is a participator sport.

Schweickart: Just step out your door and look at the gas lines.

SB: So nationalizing energy is likely to go the way of Amtrak?

Schweickart: Yeah, I think so. Maybe that is evolution, Stewart.

SB: Well, if that doesn't slow us down, nothing will. ■

On May 25 Governor Brown proposed a new state safety program to deal with nuclear reactor accidents in California, which came from a study conducted by Russell Schweickart and eight other state officials. Recommendations included: expanding the potential evacuation area around nuclear plants from the present six miles to a distance to be set by the California Energy Commission for meltdown type accidents; rapid notification procedures for all relevant authorities in event of an accident, including automatic alarm systems; increased radiation monitoring, to include possible food crop contamination up to 200 miles from a radiation release; stockpiling potassium iodide tablets for treating exposed persons so that their thyroid glands don't accumulate radioactive iodine; distributing information to the public on dealing with nuclear hazards through their utility bills and in telephone books; controlling development around nuclear sites; seeking legislation requiring utilities to reimburse the government for the costs of the new safety programs; requesting federal plans for removal of contaminated materials in event of radiation release.

A Liberal's Guide to Milton Friedman

BY JIM EGGERT

I am a liberal economist who has been forced to live with Dr. Milton Friedman, the renowned conservative economist from the University of Chicago (and, as many of you know, a recent economics Nobel Laureate). Of course I don't actually live with him, but I am forced to live with and take seriously his very unliberal and exotic ideas. Let me assure you, it is a very uneasy relationship. I must confess that this man has changed my mind about economic issues more times than I would care to admit. Before I go into detail, however, let me first give you a little background.

My first contact with Dr. Friedman came at the end of a four-year undergraduate economics major at a small liberal arts college. The economics staff, which undoubtedly had a liberal bias, felt that it was only fair to give their students "a look at the other side." Hence they eased their consciences by listing Friedman's **Capitalism and Freedom** as one of the books to be read for our comprehensive exams. Of course, I dutifully studied this little green book and dutifully marked it up with a dull pencil. As I look through these pages now, I note the many angry question marks in the margins. At that time (almost fifteen years ago), his ideas seemed to me terribly foreign – they were ideas that contradicted most everything I thought was true. My liberal inclinations told me that government intervention in economic affairs was basically good and necessary – from budgetary deficits, to welfare, to public schooling. Friedman was now telling me that these things (and many other areas of government programs and manipulation) were destructive to both the economy and to individual freedom.

Of course, I did not agree with him. The large question marks remained in my little green book. But still, there was something, even at that time, that greatly impressed me. A certain quality of the man came through despite his exotic ideas – it was his remarkable ability to communicate. I found a definite warmness to his writing and an unusual respect for his non-professional readers. For example, Friedman refused to use the *distancing jargon* that economists are so fond of using. The fancy term we learned to describe pollution (as businesses attempt to lower costs of production) was *externalities.* Friedman simply used the softer, easily understandable metaphor *neighborhood effects.* Other Friedman metaphors or phrases have, over the years, stuck in my mind like lines from a childhood poem, for example:

> Special interest groups speak with a shout, while the public at large speaks with a whisper.

Well, it is now fifteen years later. And although Professor Friedman has still not made me a bona-fide conservative economist, he is certainly moving me in that direction – slowly and steadily, like a large ship that takes its time crossing a stormy sea.

I remember reading all those **Newsweeks** where Milton is featured every once in a while. By the time I get to the business section, I am often weary of reading; but there, smiling face and all, is Milt with some more unsettling ideas. "Oh no, not again," I say to myself. But then, you can't resist. "Let's see what's on his mind this week."

Milton Friedman's response to this piece was: "The article pleased me enormously. It pleased me particularly because it so accurately corresponded with one of my favorite sayings which is that someone whom you can persuade in an evening is not worth persuading. Nobody ever really persuades anybody other than himself."

Jim Eggert, who teaches at the University of Wisconsin-Stout in Menomonie, authored a popular and well-regarded little book, **What Is Economics** *(1977, William Kaufmann, $3.95). His new book from Kaufmann is* **Investigating Microeconomics** *(1979, $4.95).*

With his wife Pat, Jim has done an appealing brief how-to text on how they built their own pole-shed house for $2,500, **The No-Mortgage Home** *– $2.00 postpaid from Eggert, Rt. 3, Colfax, WI 54730.*

–SB

So on this day he writes that inflation is a very bad thing. But since we have to live with it, why not be fair (like Brazil) and index all incomes (like the escalator clauses in union contracts). You would like to tell Milton that this idea is not very practical; but in a few days, after thinking it over, you have suddenly realized that he's probably right. A little later, you read in the papers that Congress has authorized the indexing of social security – the idea has caught on!

Another time, Professor Friedman is harping about teenage unemployment – it's up to 40 percent and more for non-whites. Cynically, you wonder if an "insensitive" conservative like Milton Friedman really understands the suffering involved in being unemployed. "We liberals are the sensitive ones," I say to his smiling photograph. My suspicions are confirmed when I read his solution to the problem. He will solve teenage unemployment by the cold laws of supply and demand. He observes that the high legal minimum wage has reduced demand for unskilled labor and increased the supply which, of course, will leave a surplus (unemployed teenagers). Therefore he says, "We ought to eliminate the minimum wages laws." My immediate reaction to such a simple analysis of a human problem was anger – imagine, describing unemployment as if he were talking about surplus corn! But after reading some studies on this problem, after talking to some small businessmen who told me they would like to hire teenagers except for the fact that they were "too expensive," I realized, damn it, he was right again. Perhaps my liberalism retained some degree of self-respect when I added the thought – "Yes, Milton, you're right only because we do live in an efficient, but impersonal system where the brutal laws of supply and demand do operate with unmerciful accuracy."

Friedman's early observations on price controls of natural gas (again using the same simplified supply and demand model), also had an uncanny predictive quality to it. Too low a price, he cautioned us, will discourage incentives to produce and encourage wasteful consumption and will ultimately result in a natural gas shortage. Well, Milton, we all know that this has come to pass too.

But there is more, much more. I recall reading originally in **Capitalism and Freedom** and later in the **New York Times Magazine** (Sept. 23, 1973) an article by Friedman on the "Voucher System" for financing public schools. The idea was quite simple. The government should offer 12 years' worth of "portable grants" so that students or parents might be able to choose the type of education they would like to have. It would be like a GI Bill for grade school kids. Furthermore, it would have the effect of off-setting the present public school monopoly. The Voucher System, according to Friedman, would make the schooling industry far more competitive – "competitive like our modern supermarkets," was his comparison. Now I must admit that being an educator myself, the "supermarket" analogy annoyed me no end. All that I could think of at the time was all the non-nutritious junk food that lined the grocers' shelves. "Wouldn't people choose 'educational junk food' as well," I questioned? He really made me angry this time.

But over the years, I've come a long way towards respecting this very revolutionary idea. One of my favorite authors, John Holt, a noted school critic, endorsed the voucher idea and he gives his readers many good reasons why it would be superior to today's "no-choice" public school system. Also, it occurred to me that our GI Bill, which was designed to help returning veterans finance college was, indeed, a very successful program – partly because it was in the form of a portable grant. That is, the government did not insist that you use your GI Bill money for a government school. And finally, I found myself shopping in large supermarkets because (I had to admit to myself), "of the wide variety of choice." I was sold.

I was sold about the same time that the National Institute of Education began conducting actual experiments of the Voucher system in the Alum Rock school district in California. I was impressed when I read David Selden's (former President of the American Federation of Teachers) article entitled "Vouchers – A Critic Changes His Mind" in the magazine **Nation's Schools and Colleges** (June, 1975). Was Milton Friedman, once again, slightly ahead of his time?

Another example. By now, most of us have heard of the so-called "Negative Income Tax" (NIT) – another early Friedman idea. The NIT was proposed as a replacement for our present welfare system. It would give families or individuals a portion of their "unused exemptions and deductions" if their incomes happened to fall below the poverty line (wherever that might be defined). A simple idea. And indeed, a very logical idea that would efficiently offer everyone a guaranteed minimum income. If properly administered, Friedman felt that it would be able to replace all existing transfer payments and "in kind" subsidies that we presently offer people, from food stamps to social security, from veteran's benefits to Aid to Families with Dependent Children. Negative Income Tax was not a particularly difficult idea for me to accept. In fact, I don't think it is too much of an exaggeration to say that most economists favor NIT over the present welfare system – a system that has frequently been characterized as both inefficient and destructive to family life. Indeed, our last three Presidents have not only endorsed this idea, but two of them have proposed their own welfare alternatives based on the negative income tax principle. No wonder Milton is smiling!

[more →]

By the way, all these ideas and proposals have been made by Dr. Friedman above and beyond his contributions in the scholarly field. Here, his monetary theory has gained wider and wider acceptance throughout the basically "liberal" economics profession. In short, Friedman has told us that "money matters" in terms of stabilizing the business cycle (whereas in the Keynesian model, the key consideration is the overall level of spending). Although his recommendation of increasing the money supply at a constant rate (3 to 5 percent) has not been completely accepted, Friedman's emphasis on the importance of the money supply is now widely respected among his professional colleagues. Friedman's research and theories of monetary policy certainly played a large part in the decision to grant him the Nobel prize in economics, and this research is, I'm sure, what most economists consider his greatest contribution to the science of economics.

But I personally don't think so. Indeed, I am tempted to place Milton Friedman's legacy with his NIT or Voucher System, or perhaps with his instructive use of simple supply and demand to see through the problems of energy and unemployment. I am tempted to say that it is these ideas, which I have grudgingly come to accept, as his greatest contribution. But no, there is something more. His idea of greatest importance may just be a little-discussed observation from his book **Capitalism and Freedom.** It is one of those ideas I had placed a large question mark next to fifteen years ago – but am now gradually accepting. What is it? What will Friedman (in my opinion) be remembered for a hundred years from now? It is his unique observation concerning the destructiveness of certification and licensure.

Imagine if you will, Milton Friedman standing up before a large gathering of the American Medical Association (which he did), and saying in effect that one of the major problems facing medicine today is the fact that doctors are licensed. He would go on to tell them that licensure has the effect of reducing the overall quality of American medicine by reducing the number of doctors (making them too high priced), by not allowing paramedics or other types of practitioners to enter the industry (who could administer low-level medical service) and finally, by reducing the incentives for research and development. By the way, each of these arguments had already been meticulously defended in Chapter Nine of his little green book. And each possible objection, Friedman anticipated and carefully answered.

For example, a person might logically ask how, in the absence of licensing, he or she might be able to "count on" quality medical care. Friedman answered (and I'm paraphrasing slightly): "Any person who wished for Cadillac medical care would be free to demand proof of prior experience and training in the form of a certificate or possibly by a 'Consumer Report' type testing agency."

I must confess that Friedman's exposé of the AMA as nothing more than a self-serving vested-interested group, or worse yet, a union, did tickle my liberal imagination. Here was this Professor from Chicago, a man whom these conservative doctors must have thought of as "one of their own," now speaking perhaps the most unpopular words imaginable. "A rare act of courage," I thought and my respect for this unusual man must have made a complete quantum jump. Now I am hoping that a few brave souls in the medical profession, or in the legislatures around the country, might read (or reread) this remarkable chapter (chapter nine) and take up the battle where Milton left off.

But you can't stop with just medical practice. Indeed, Friedman was not only talking about the detrimental effects of licensing doctors, but about the evils of licensure that exists with all licensed professions, from pharmacists to librarians, from teachers to stockyard commission agents. In each case, the negative effects of licensing are the same – licensing erects a barrier to free entry and will ultimately raise the price to the consumer by reducing the availability of practitioners. In each of these groups, the "professional society" or "union" sets up obstacles in the form of credentials and prior schooling necessary to move into the profession. One nice thing about this system is, if you wish to raise wages (by restricting entry even more), you simply tack on more schooling and credentials. By the way, this technique does not, according to Friedman, guarantee high quality performance. In many cases, he points out, the prior requirements have little relationship at all to the job that will eventually be performed – they become merely obstacles. In other professional groups (such as doctors or college teachers), there is no retesting of performance even if the initial examinations took place many decades ago. And furthermore, anyone who "pops up" fully qualified to do the job (for whatever reason), or anyone who has a brand new way of solving problems within that profession, cannot (by law) practice unless he or she goes through the long and arduous educational-certification process.

Has Friedman really got something here? Has he made an observation far more revolutionary than Parkinson's Laws or Peter's Principle? To the best of my knowledge, very few people have looked at this problem very seriously. One person who has realized that something is amiss in the world of credentials is Ivan Illich. Illich's attack on contemporary education and his rallying cry for "Deschooling Society" (the title of one of his books) has made him into a kind of "philosophical guru" of the counterculture. In **Deschooling Society**, Illich makes the point that educational competence can come in all sorts of packages, and for our present system to insist on only "credentialed" individuals as the only legal educational resource has had disastrous consequences for us all (and even more specifically, for the less-developed countries). Illich says he would like to "detach competence from curriculum." He further states that:

> Inquiries into a man's learning history must be made taboo, like inquiries into his political affiliation, church attendance, lineage, sex habits, or his racial background. (**Deschooling Society**, p. 12.)

Illich has also made some rude remarks about modern medicine in his more recent book **Medical Nemesis.** Ivan Illich seems angrier, his language is certainly more politically charged – and yet, I think he is

really saying the same things that Friedman, in his own eloquent way, said many years before.

Now I wonder if Friedman and his following will really be listened to this time. Perhaps there is now simply too much at stake, too many vested interest groups, too many lobbying associations, too much political influence to make any headway against this problem. After all, didn't Friedman himself once say, "special interest groups speak with a shout."

But still, I'm sure if I catch Milton Friedman in the next issue of **Newsweek**, he will still have that smug smile on his face – a smile that has now for many years made this liberal economist so terribly uneasy. ■

PARTIAL ANNOTATED BIBLIOGRAPHY

During the mid-30s, Friedman joined the New Deal (!) to work for the Industrial Section of the National Resources Committee and soon thereafter, the Committee, with Friedman's statistical research, put together a book called **Consumer Expenditures in the United States.** He later went to work for the National Bureau of Economic Research in New York and in 1939 the Bureau published **Studies in Income and Wealth** under Friedman's editorship. I doubt if these two books would be of much interest now.

Outside of the scholarly articles and his frequent Newsweek columns, Friedman wrote the following four books which contain his basic economic philosophy.

1. **Essays in Positive Economics** (1953, 1966, University of Chicago Press, $4.95).

This book contains a variety of essays – the most important being, "The Methodology of Positive Economics." Here Friedman attempts to make a distinction between positive economics (economics as scientific and independent of value judgments) and normative economics (economics based on personal value judgments). Friedman argues that eventually economics will become more and more objective – like the physical sciences – and consequently policy suggestions among economists will be less diverse. To move in the direction of "positive" economics, you must evaluate your theory by its predictive accuracy. According to this criteria, the "free market" theory of classical economics offers the best and most accurate predictions.

2. **Capitalism and Freedom** (1962, University of Chicago Press, $3.45), with the assistance of Rose Friedman.

Capitalism and Freedom is by far the best single work summarizing the economic philosophy, ideas and policy suggestions of Dr. Friedman. This book is geared specifically for the interested non-economist. It is extremely well written and offers convincing arguments for such "Friedmanesque" ideas as The Negative Income Tax, Public School Vouchers, the importance of monetary policy and balanced budgets, the evils of occupational licensure and government price regulation and the value of free international trade and freely fluctuating exchange rates. The opening two chapters discuss the relationship between economic and political freedom and suggests we return to the economics of classical laissez faire liberalism.

3. **A Monetary History of the United States 1867-1960** (1963, Princeton University Press, $5.95), in collaboration with Anna J. Schwartz.

This book is a study of approximately one hundred years of U.S. monetary policy. Indeed, this **History** is probably Friedman's most respected professional book. The findings of this study amplified Friedman's contention that "money matters" and that the Federal Reserve's monetary policy over the years has had a significant impact on maintaining prosperity (when applied correctly) or in creating inflation or depression (when applied incorrectly). One of the more controversial conclusions of this book is that the Great Depression of the 1930s was primarily caused by poor monetary policies – i.e., by letting the money supply decline too sharply. Needless to say, this conclusion is not accepted by the majority of "Kenesian" economists. Yet this massive monetary history remains an impressive work by any scholarly standards.

4. **Dollars and Deficits – Living with America's Economic Problems** (1968, Englewood Cliffs).

This book contains twelve of Dr. Friedman's essays covering a period of about 15 years. The criterion used to select the pieces were a) readability and b) they would be discussing the issues of inflation, monetary policy and the balance of payments. Included in these essays are some of Friedman's most cogent arguments for laissez faire economics. I particularly recommend the two essays "Inflation, Causes and Consequences," and "Free Exchange Rates."

I would also highly recommend a book that was a powerful influence on the thinking of the younger Milton Friedman. It's Friedrich Hayek's **The Road to Serfdom** (1944). I just finished it myself and feel that its message is still pertinent.

Other books by Milton Friedman that are in print include:

Adam Smith's Relevance for 1976 (1976, Green Hill, $1.95).

The Counter-Revolution in Monetary Theory (1972, Transatlantic, $2.50).

An Economist's Protest (2nd ed., 1975, Thomas Horton & Daughters, $3.95).

From Galbraith to Economic Freedom (1977, Transatlantic, $2.75).

Monetary Correction (1975, Transatlantic, $2.95).

Optimum Quantity of Money and Other Essays (1969, Aldine, $14.95).

Price Theory (1976, Aldine, $14.75).

Program for Monetary Stability (1975, Fordham, $4.00).

Theoretical Framework for Monetary Analysis (1971, Columbia University Press, $12.50).

There's No Such Thing As a Free Lunch (1975, Open Court, $3.95).

Unemployment Versus Inflation (1975, Transatlantic, $4.50).

Social Security: Universal or Selective (with Wilbur J. Cohen, American Enterprise, $5.75).

Monetary Versus Fiscal Policy (with Walter Heller, 1969, Norton, $3.95).

The Balance of Payments: Free Versus Fixed Exchange Rates (with Robert Roosa, American Enterprise, $4.50).

Milton Friedman's Monetary Framework: A Debate With His Critics (1975, University of Chicago Press, $3.95).

Essays on Inflation and Indexation (1974, American Enterprise, $3.00).

Abstracted in Sacramento

The late great State Architect tells what he learned about power.

BY SIM VAN DER RYN

Candor was what made Sim Van der Ryn one of Jerry Brown's best appointments. At the time (1975) it was seen as one of the Governor's chancier moves. He had other New Age types in government (such as myself), but they were advisors, consultants, and commission members. State Architect was a line position – highly visible, highly responsible, with an office of 350 to administer and budget of $12 million to spend (construction $200 million). Legislators, press, and the architectural professionals prepared themselves to ridicule, but they never got a chance.

Sim turned out to be a shockingly good bureaucrat. He had the best press relations of anyone in the administration – thanks to his candor, humor, Dutch good sense, and on-going newsworthiness. His office loved him and did good work, and some of the work was substantial, such as Site One – the largest climate-modulated building yet designed.

Consider the inversion that Sim's success represents. He was a highly effective outlaw of the '60s – involved in the Berkeley People's Park controversy, quit his University of California professorship to start the alternative technology Farallones Institute. In a mere couple of years, without a public revolution or personal moral compromise, the fringe became the center.

This account is from a talk that Sim gave to the Lindisfarne Fellows in New York City last June (1978) shortly before he left office. The Bill Thompson mentioned is William Irwin Thompson, the co-founder of Lindisfarne. Richard Baker Roshi, abbot of the San Francisco Zen Center and friend of the Governor, also was on hand. The theme of the 1978 Lindisfarne Fellows Conference was "The Cultural Contradictions of Power." From my scattered experience, what Sim is saying applies to any level of government, anywhere.

–SB

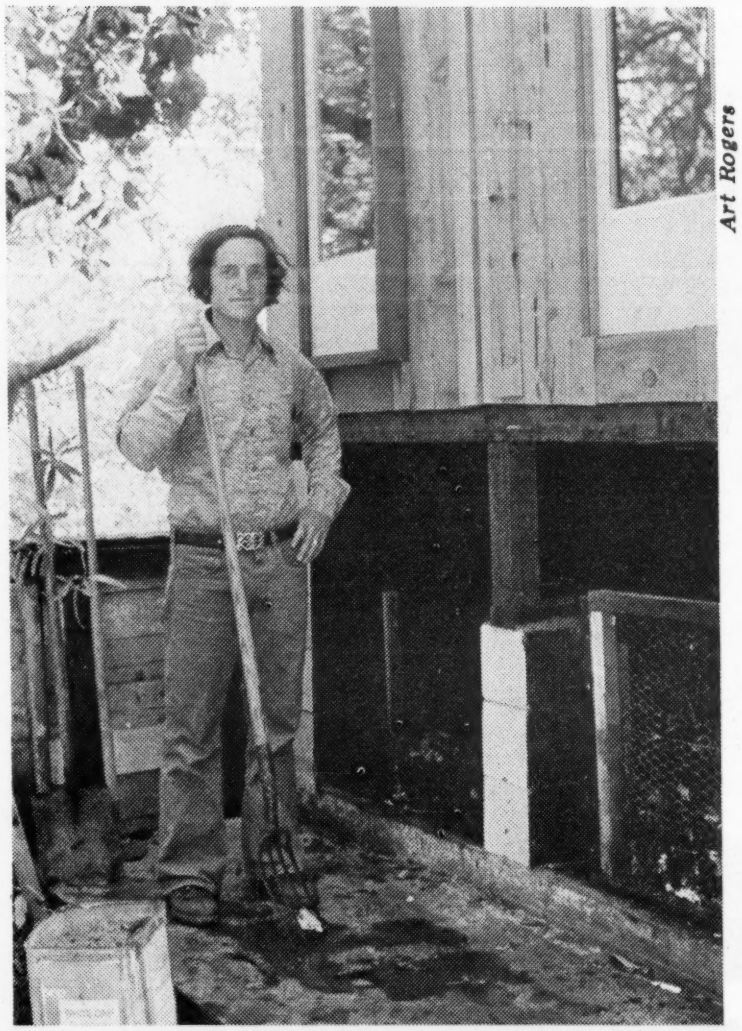
IN 1974 I WAS SITTING AROUND my cold, leaky house, my family about to split up, and already fed up with some of the problems that Farallones was developing – the new age spirit was disintegrating into hassles about money and power and such – problems that Bill Thompson never talked about in his books (I read **The Edge of History**, and I said, "Right on! Create new institutions!" But there was always the same old shit!)

So there I was in my cold house. I said, "How can I get warm? I know what: I'll go work in Government, where I can live in a warm apartment." It was 1974 and Jerry Brown was running in the Primaries for Governor, and I had a good friend who was a close friend of his – Jerry often stayed at his house.

I'd talked to Jerry once when I was an early est graduate. I remember getting home from est after my graduation and about two in the morning I flashed, "Carl has to take est." So I got on the phone to Carl. "Carl, I've got to tell you what I've just experienced. I want to let you into my space, Carl." And I went on at 2 o'clock in the morning for half an hour. And then the voice on the other end says, "This isn't Carl, it's Jerry Brown." Later I talked to Carl, and said, "Carl, I have a lot of ideas about energy policy," so I wrote some energy policy memos, and Carl gave them to Jerry who never read them.

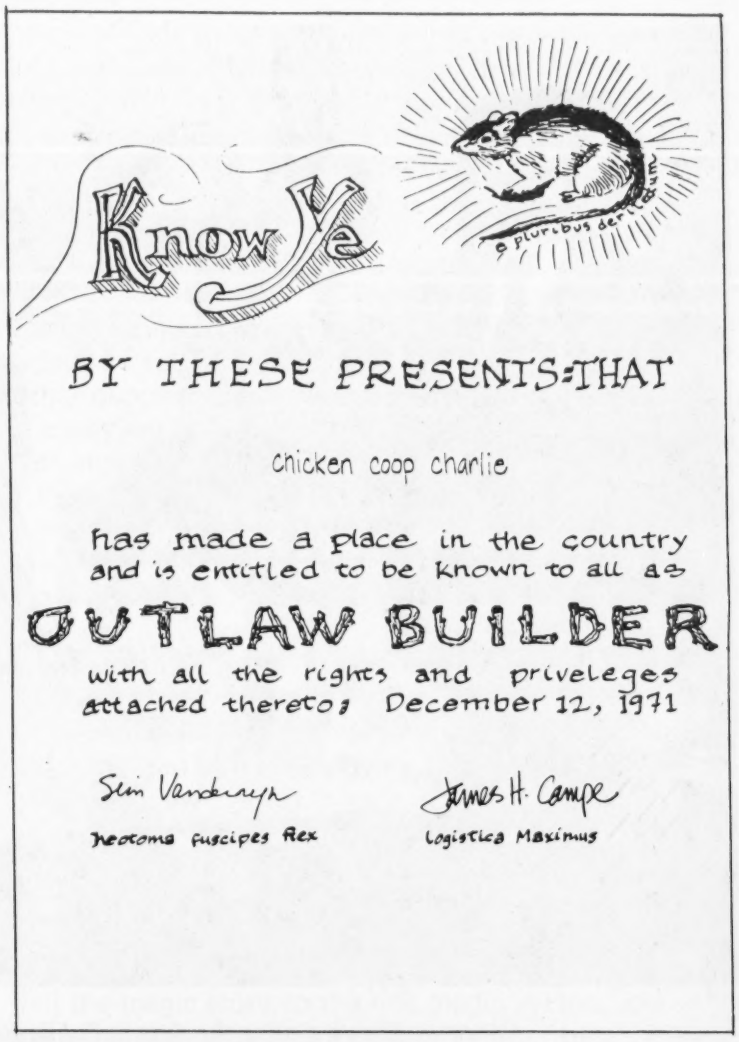
Meanwhile, I moved to the Farallones Rural Center. We were having a big fight with the Building Department, and I figured that if I built a gypsy wagon on an old truck chassis, then I was not living in a house and everything would be all right. But they passed an ordinance to limit the number of structures on wheels that we could have on the place, so I was in trouble on that score too.

From Farallones I wound up in Sacramento. Baker Roshi, who denies he has any interest in politics, had something to do with it. I agonized about going for a



Art Rogers

The author "at the Farallones original compost privy a week after going to Sacramento."



"Certificate awarded to students in my first University of California outlaw builders class."

"In the State Architect's office. I've got the same uniform as in the compost privy photo: human shit, bureaucratic shit."

Governor Brown signing the Arts in Public Buildings bill in September, 1977. Sim at right, poet Gary Snyder (then chairman of the California Arts Council) next to him.

long time — I was turned off by the idea of bureaucracy. I went back in my mind to all those earlier University experiences and thought, "What could I possibly gain from Sacramento? It's true Brown's an interesting guy, some new possibilities, but I'm already involved in some good possibilities." After four months of negotiation and talk, I wrote a letter and I said, "Thank you very much, but no." And the next day I got a phone call from my friend Baker and changed my mind. That's politics.

So I went to Sacramento. What have I found out? The first few months were extremely euphoric because things got done, letters got typed, phone messages were taken. Part of the euphoria was that I was able to start putting into practice a lot of things I had been thinking about. There's great power to that. Power is intention put into action. For example, one of my responsibilities had to do with about 42 square blocks right around the Capitol — they're State owned — and there was a large group that was puzzling over what to do with the area. I walked in the first meeting, with the TV whirring, saying, "Well, here's what we do — Sacramento's a low city, let's keep it low, let's not build an office ghetto but bring people back into the community, and let's really design according to the climate." Everyone throught it was wonderful, and I thought, "Jesus, people are listening." So there was a good rush as that happened. Maybe one principle that works in politics is that of surprise.

Intention and belief count very heavily, for a while, in the political situation. There were two existing sixteen-story state office towers that had been built, and I discovered the first week I was there that they were just going to pull the plans off the shelf and build two more. I said, "No — we're going to build a building which really demonstrates the full possibility of renewable energy sources and designing with climate." And I began to set about doing that. That was early in the spring of '76 .

It's too complicated to tell you about how Government works, I didn't know how it worked, which was another great advantage, because I went into the Committee hearings with the plans for the building, and I presented the building design. There was a very cantankerous Assemblywoman who was Chairman of the Committee, and who was known for giving everyone a really hard time. She said, "What makes you think this will work?" I said, "Because I know what I'm doing." So they appropriated $18 million to do the first building.

I found out later that I'd broken all the rules — you never brought in designs for anything. You just asked for permission to start designing a building, and then it was a five-year project — you came in one year and asked for money for the design, and the next year you asked for money for construction — a whole bureaucratic process. Well, I won the first round on surprise. I did something that hadn't happened before, and even the conservative people liked that. But time caught up with me because the real power lies with someone called a Legislative Analyst — who sets the agenda for the Legislature — and the Department of Finance — which theoretically works for the Governor.

My power had been eroding because I did a lot of things wrong if maintaining power were my goal. If you want to maintain power in the bureaucratic system, you have to be forceful, make decisions whether they're right or wrong, act like you know what you're doing. You don't scratch your head or say, "Well, I'm not sure." I do a lot of wondering and I don't spend my time defending my turf. The process of Government is mostly about building and maintaining your turf, and that's why the best thing people can do is cut off the water and dry up the turf, like Proposition 13. One of my friends got fired for sending his boss a bale of turf-builder.

The losers in the power game like to get together. I'd like to record their stories because they're the ones who really have the good stories about the system. I found the bureaucratic game of maintaining power rather boring. Government is about nothing in particular, and it deals with the particular in the abstract. I consider language to be abstract — I consider a description of a bio-shelter to be much more abstract than the bio-shelter itself. So Government deals in abstractions. And because Government's about nothing in particular, symbols become everything.

I'm fed up with Government by symbol. I know that's how the whole system works, and therefore how these symbols are manipulated is crucial. I'd like to do something, but when you want to do something, you're forced to always consider total symbolic effect, and I became increasingly paralysed because I'm not primarily concerned with the symbolic effect of what I do. I'm not a full time public person. One thing that was obvious to me when I came to Sacramento was that the state owns all these apartments, so let's start putting solar collectors on them. Jerry Brown lives in a state-owned apartment; let's put a solar collector on his building. I wanted to put one there because it turned out his building was a very easy one to convert. But as soon as I did this kind of experimentation in the hot lens of publicity, Murphy's Law took over.

Government is full of symbolic action and images. What's real is direct action, and the only people who can take direct action are you. It's practice, it's attention to particulars, it's attention to the land, it's caring, it's mindfulness, carefulness in terms of other people and living things, and Government can't do any of these things.

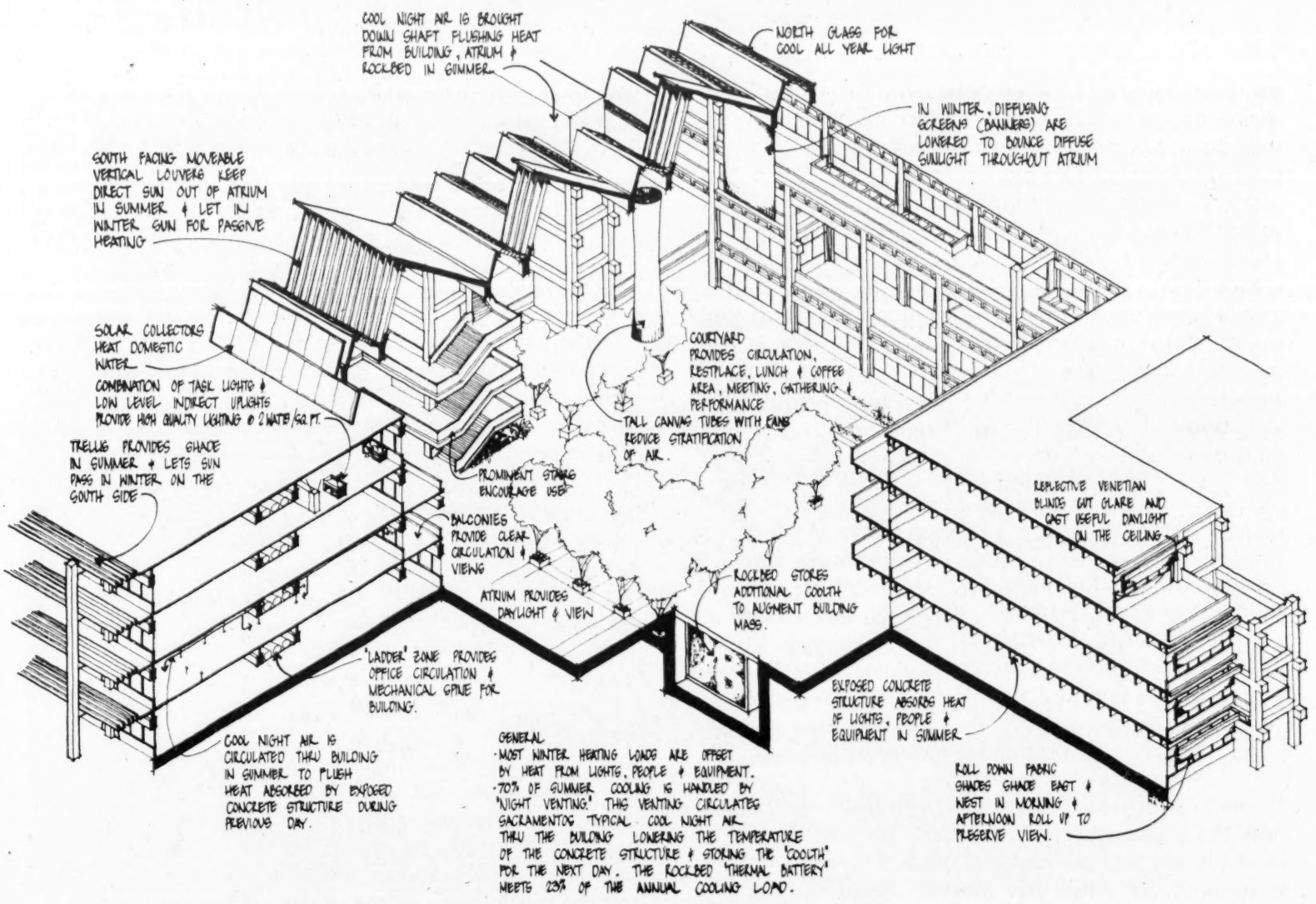
There is one important lesson I've learned around that, which again relates to power. When I went to Sacramento, one of the problems in getting appointed was the fact that there was an injunction against me and against Farallones Institute in Sonoma County, because I'd built a compost privy without getting a permit (for the simple reason that they wouldn't give me a permit — which is a whole other story). Well, the bottom line was that I felt that the compost privy was right, and finally I just did it. I was getting the administrative shuffle for months and months. So I finally took action and was ready to take the consequences. That was a difficult act for me to take, because my parents are European and I'm very frightened of authority and going to jail and things like that. My mother always asked me, whenever I left the house, "Do you have your driver's license with you?" As if she'd never see me again if I left without it. One of the nice things about driving around with the Governor is you don't have to look in the rear view mirror to see if the Highway Patrol is behind you. Although I notice Jerry does — maybe he's worried about authority too.

On the compost privy — I made some things happen because I took direct action, and so did a number of other people around what we did with our shit and the way we built our houses. So I get appointed to this important job in Sacramento. "BROWN APPOINTS HIPPY ARCHITECT." And then another person who had been leading the fight against the restrictive building codes got appointed Housing Commissioner. And we're set to change everything. We're going to make all the good things legal. Well, we've gotten absolutely nowhere, although we've spent a lot of time on this issue, and my conclusion about it is that because we were the good guys and we were seen as having power, everyone out there said, "Fine, we've got friends in Sacramento, let's relax." I used to go around thinking that there were people in power, and if you could get to them they could push the button and they could make things happen. Well, I found out it isn't so. There are networks, there are connections, but very seldom do you tell the magic story to the one magic person, and turn the pumpkin into a coach. I think there's a great danger in thinking because the good guys now have something called power that everything's going to be all right.

More on power. The Governor has a red phone — a hot line to his Cabinet. One day it happened that he said, "Get Rose Bird on the red phone." "Yes, Governor." "Well, where's Rose?" "She doesn't want to talk to you, Governor." You have a hot line, but what happens if no one wants to answer on the other end? She didn't answer the phone so much, she got appointed Chief Justice.

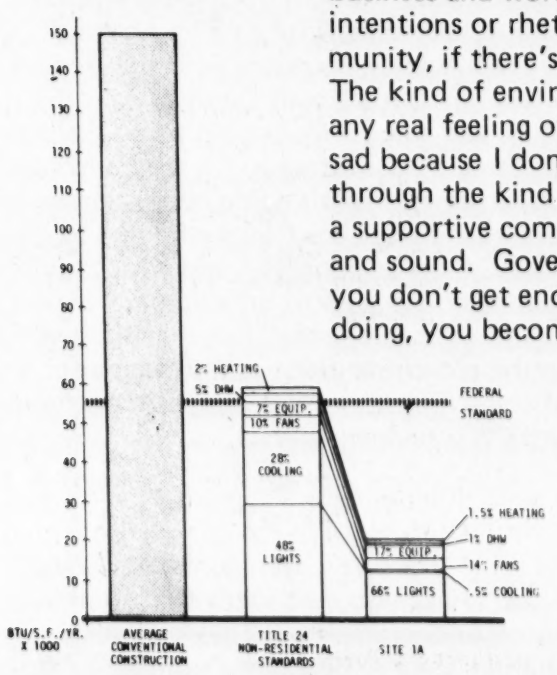
The solar collectors leaked on the Governor's roof, and he was concerned about that. "Well, let's get the solar collectors fixed." "Right, let's get them fixed." "Who's going to take care of it?" "The Agency Secretary." The Agency Secretary calls the Department Director; the Department Director calls the Division Chief, and so on. We couldn't find a plumber in the entire State of California to fix the collectors! Jerry Brown screams, "What's going on around here?" We finally found a guy in Los Gatos who had to drive three-and-a-half hours to get there, and why couldn't we find a plumber? Because of jurisdictional difficulties. It's all very complicated, but the net result is you pick up the red phone and nothing happens. You push the button and nothing happens. But everyone thinks something is happening.

There is no such thing as New Age politics. Ask yourself, would you like to work in the environment that Government is in? Have you even gone into Government buildings? Have you ever spent time in places like Washington or Sacramento? They're horrible, they're alienating, they're ugly, they're total institu-

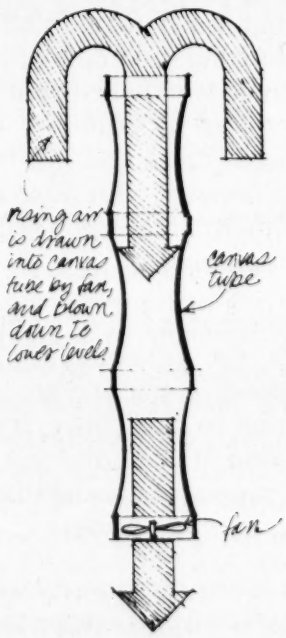


"My major effort while in Sacramento at improving my talk/do ratio. Site One extends passive solar design from the single family house to the large building – for energy savings of 75% (from a gallon of gas required to heat, cool, and light every square foot per year to less than a quart."

tions. I care about creating warm and comfortable places, and one of my hopes was that my partner Ruth and I could create a place in Sacramento that was warm and inviting and where people were welcome to come. Ruth is a woman of tremendous energy, graciousness, and very attuned to creating a beautiful place, but she finally said, "No one has any respect for my home."



There is no New Age politics because, from what we experienced, there is very little caring for each other. There is no real community in Sacramento, and what do you have if you don't have that? Then it's just business and work, and no matter how high-blown the intentions or rhetoric are, if there's no sense of community, if there's a lack of real caring, there's nothing. The kind of environment around Jerry Brown lacks any real feeling of community, and I think that very sad because I don't know how anyone can stay healthy through the kind of pressure that's in politics without a supportive community around to keep you sane and sound. Government tends to be a lonely place, you don't get enough feedback about what you're doing, you become a prisoner, your time is controlled.



CANVAS TUBE CIRCULATION SYSTEM

Someone like Baker Roshi is an extremely busy person — as busy as the Governor — but somehow his life is organized in a way where he's in control of it, and what I see in Government is that most people in power are not in control of their time.

I think it's a very serious thing that leaders who are making important decisions for all of us have lives that are so out of balance. They don't eat right, they're not involved in any place. I don't know how

you can maintain balance unless you're involved in maintenance functions. In the last six or eight months my partner's been away a lot, and I have responsibility for two teenage boys, so I have to be home a certain time and make dinner, and I've come to value that. I've come to learn something about maintenance, which I finally see as an enriching thing rather than something that's taking my time. In the past it was always, "Oh, I can't be bothered with that, I'm much too busy, much too important." Now it's become a haven of sanity to go shopping, cook dinner, and clean up. That is my first criteria in voting for somebody. I want to know, "How often do you cook your own food and make your bed and things like that." Do you want someone making decisions for you who doesn't know how to make a bed or never carries any money because someone else always pays?

I remember in **Life** magazine — years ago — there was a picture of Harry Truman's Vice President, Alben Barkley, standing at the sink washing his dishes in an old-fashioned kitchen, and all these letters came into **Life** magazine saying, "This is terrible; buy the Vice President a dishwasher." We've spawned a generation of politicians who don't know jack about basics. I'm very skeptical about that because I've seen it myself. If you don't know about basics, you don't really know about anything else.

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The group at Lindisfarne sensed that this talk was something of a catharsis for Sim. He was exhausted and strung tight and in the thick of his decision about leaving Sacramento.

For perspective it's worth noting some of his comments from a talk a couple months later, reported by Bill Hurrle in the No. 36 issue of **Alternative Sources of Energy** *($2 from Rt. 2, Milaca, MN 56353).*

Don Marier: What can government do?

Sim: "Provide leadership. A person. People out there generally want to relate to people. If they hear something from someone they trust and like, that means something. People are turned off to collective rhetoric, even if it is for all the right things. We do have personal leadership in California.

"Government is also legislation, regulation and programs. But all you have to do is talk to legislators who've had great ideas for programs and watched the bureaucrats take it over. I've nothing against bureaucrats, but at this point in history it is a system that doesn't work very well. Government is one arena, and it is going to be involved in energy and the allocation of resources, but I feel people sometimes pin too much hope on it or on some specific piece of legislation. By the time it comes out the other end of the meat grinder, man, you don't recognize it."

Sim emphasized that Jerry Brown's personal leadership — buttonholing, jawboning, extracting pledges from the prominent and lending the power of his office to the renewable side of the energy ruckus — is a major reason for California's successes. Don bemoaned the general lack of such leaders, and Sim countered that the game would then have to be played out another way, through the market place.

He quoted Brown's saying, "Government is mostly smoke and mirrors," to illustrate the size of the role it has to play in the coming of the renewables compared to market forces. "Create a pressure group that instead of working indirectly through government goes directly to the actors. Go to the lenders — it doesn't have to be confrontation politics of the '60s — but you go and make your case. If solar is as good as we say it is, it seems to me that a reasonable guy will put his money on it. . . ."

Sim is not desperate to force solar's style, and told a Sacramento story to illustrate: "I used to get frustrated with not getting anything done. Then I'd find out from talking to people in the field that the mere fact that I was there enabled them to get something done. Not that I did anything, there was just resonance. All this linear planning, linear thinking — building solar into some kind of government-based religion — just misses the point. If it is going to happen, it is going to happen through all those channels that are out there. Here is a society that lives in a forest of machines and tools. They damn well can do anything they want to, and the business community the same way. That just hasn't happened.

"Appropriate technology has become a little, institutionalized movement, and I'm not getting much juice out of that. Right now I'm more interested in meeting another realm of people. I went to Sacramento from a very special environment of people who were supporting each other's way of life. That was very good, but the only problem is you tend to confuse that with the world. One of the things I learned at Sacramento was to really appreciate that there were lots of kinds of people. I fell into seeing what they were doing. My goal right now is designing and developing an energy-efficient, stable resource-based community which all the folks out there will buy. I'm working on it as a paradigm and applying the principles in a number of different settings. It is a long project. To make that happen I have to find out how that is done, how the market place really works." ■

In October, 1978 Sim gracefully resigned. His former assistant, Barry Wasserman, took up the duties of State Architect and continued the good work. Sim these days is all over the map, speaking, writing, consulting, scheming up a Solar City, and, as he suspected, with his private firm, taking up even grander projects than he had in government.*

What's interesting to me is that by stepping temporarily out of his advocacy role into a policy position, Sim did not diminish his on-going advocacy but instead strengthened it considerably. Any career advocate might do well by cycling through occasional policy and assistant positions, both in government and business.

—SB

**Van der Ryn, Calthorpe & Partners, Inverness, CA.*

Material invited for CQ metric argument book

Books In Print *lists about 200 books currently available on the metric system and American conversion to it. All 200 are pro-metric. Most are purely assertive — they do not debate, or prove, or report much on actual activity. When they do, it is one-sided.*

Accordingly we are assembling a book on metric which does debate and does report on actual activity. If you've had illuminating experience with metric conversion or with the relative merits of the two systems, send it in. We pay you for what we use.

- *Glen Egstrom, a professional diver on the California Metric Conversion Council, told at our first meeting about getting fitted for a wet suit in Japan. By mail he gave his measurements politely in centimeters, since Japan is metric. The Japanese politely assumed he meant inches, tailored an enormous wet suit, and showed up at delivery to see what sort of man was going to wear it.*

- *Eugene Schoenfeld (Dr. Hip) reported a hospital incident to us where a nurse confused metric and customary measure of a medicine and nearly gave a lethal dose to a patient.*

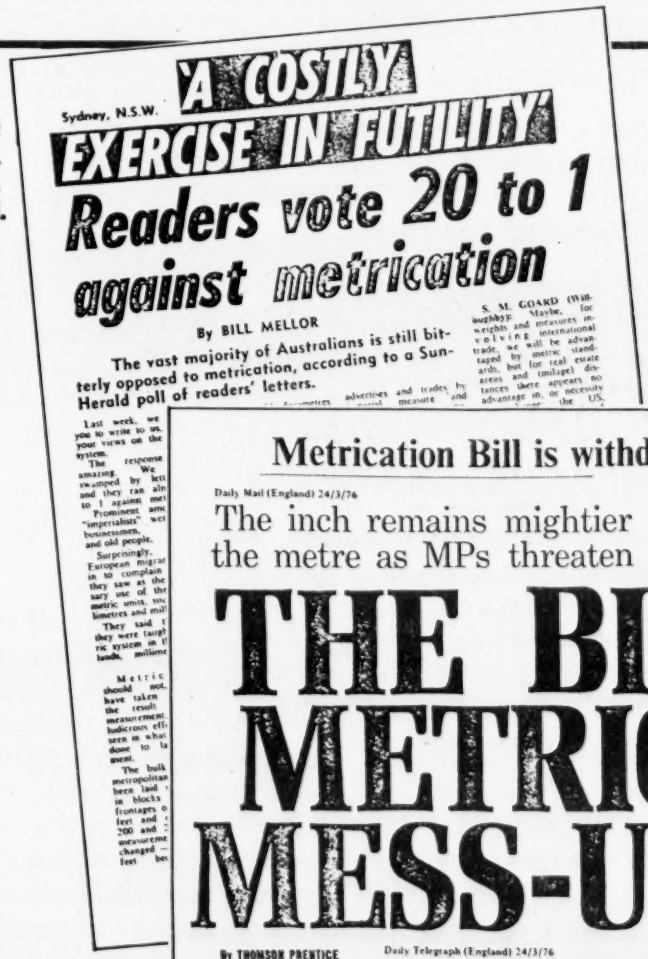
- *Lorne Petersen of Ottawa, Canada, sent us news clippings detailing some of the frustrations of Canadian shoppers with metric conversion — from having grocery measures not match what's in the family recipes to having to remember that a half bushel of potting soil is 18.18 dm^3.*

Each of these experiences could be used to support pro-metric or anti-metric arguments, but all of them demonstrate the inconvenience — sometimes trivial, sometimes colossal, sometimes truly dangerous — of everyone being on a dual measuring system, which is inevitably produced by a half-hearted conversion supported by government but not by the populace.

Enough experience now exists, we feel, for America to make up its mind one way or the other: 1) Go whole hog for metric, or 2) Drop the government program and propaganda and leave metric where it is, an available, legal, and sometimes very handy system for specialized sectors. Our book, being edited by Alia Johnson and myself, will try to muster the experience and focus to aid that decision.

—SB

Newspaper articles from the Sydney, Australia, **Sun Herald** *and the British* **Daily Mail** *and* **Daily Telegraph.** *Reproduced from* **American Metric Journal.**



Sydney, N.S.W.

A COSTLY EXERCISE IN FUTILITY

Readers vote 20 to 1 against metrication

By BILL MELLOR

The vast majority of Australians is still bitterly opposed to metrication, according to a Sun-Herald poll of readers' letters.

Last week, we ... you to write to us, ... your views on the ... system.

The ... response ... amazing. We ... swamped by let... and they ran alm... 10 1 against met...

Prominent ... arm... "imperialists" ... were ... businessmen, ... and old people.

Surprisingly, ... European migrat... in to complain ... they saw as the ... sary use of the ... metric units, suc... kimetres and mil...

They said t... they were taught ... ric system in t... lands, millenn...

Metric ... should not ... have taken ... the result ... measurement ... ludicrous eff... uses in what ... done to la... ment.

The bulk ... metropolitan ... been laid ... in blocks ... frontages o... feet and ... 200 and ... measureme... changed — ... feet bec...

S. M. GOARD (Wil... oughby): Maybe, for ... weights and measures in... volving international ... trade, we will be advan... taged by metric stand... ards, but for real estate ... acres and (milage) dis... tances there appears no ... advantage in, or necessity ... the US ...

advertises and trades by ... measure and ...

Metrication Bill is withdrawn

Daily Mail (England) 24/3/76

The inch remains mightier than the metre as MPs threaten revolt

THE BIG METRIC MESS-UP

By THOMSON PRENTICE and ALAN YOUNG

BRITAIN'S march towards compulsory metrication stumbled to a halt last night.

A storm of protest has forced the Government to shelve the Weights and Measures Bill, which had a second reading due tomorrow.

This would have given Prices Secretary Mrs Shirley Williams extensive powers to force traders to change from Imperial measures—pounds, ounces, feet and inches—to kilos, grammes, and metres, by specific 'cut-off dates for different products.

Daily Telegraph (England) 24/3/76

GOVERNMENT DELAYS METRICATION

Defeat

The official reason for shelving the Bill, given by Mr Edward Short, Leader of the Commons is that more time is needed for 'consultation.'

But the real reason is the certain knowledge of senior Ministers that it would have brought a humiliating defeat for the Government.

The Tories—and a large and influential body of Labour backbenchers—preferred a voluntary scheme. Fearing that compulsory metrication would result in hidden price increases similar to those which accompanied the changeover to decimal currency.

Mrs Williams herself would prefer voluntary metrication ...

...extreme and construction... food, clothing and in schools.

Reaction last night to the Government's decision was mixed.

John Hoker, director of the Government-backed National Consumer Council said:

Shoppers are already pouch-drunk and have enough to contend with without having to learn complicated new measures as well. The Government's action is a proper appreciation of the apprehension people feel.

Metric conversion elsewhere

Dear Stewart;

Experience in other countries varies from quick but very forceful changeover in South Africa to nothing but resistance and resentment in England to passive acceptance in Australia after a few slick tricks by the government. Even New Zealand had problems and had to force conversion on the retail merchants after seven or eight years. Laws were passed to compel each of all the countries changing to metric in the past two to three decades. In fact, no country ever changed on a voluntary basis since the beginning of metric back in the 1600s.

The public voted 20 to 1 against it in Melbourne last summer in a newspaper survey.

The British shelved legislation to force metric in the retail market with stiff penalties, after the public raised a cry of indignation during the summer last year.

Metric has always been opposed during the twelve years of attempted change in England. There are several anti-metric organizations in both Australia and England. A newspaper survey in Canada last year indicated over 47% dislike metric and after ten years only 10% understand the new road signs.

Sincerely,

Bob Hopkins

P.S. As you know metric has been legal to use on a voluntary basis in both America and England for over 100 years.

Note. Bob Hopkins is editor of the **American Metric Journal,** *the most (in fact, only) objective publication on the subject. Get it bimonthly for $48/yr., from Box 847, Tarzana, CA 91356. Bob is all for converting the U.S. to metric, but he's honest about the difficulty and expense of doing that. For someone actually planning to convert their business to metric, or facing a decision to convert or not, that's essential information. For more on this matter see p. 141.*

—SB

Muddling Toward Frugality

Granted, the title lacks — panache. "Muddling" has a weary, faintly comic sound, while "frugality," a strange old-fashioned word in opulent America, generates no sex appeal whatsoever. This book will not likely reach the bestseller lists, unfortunately, nor will it create either cult or coterie for the author. And yet the title is exactly right for the book, humble but precise, and this is a good book.

Mr. Johnson's thesis can be summarized without much difficulty: after generations of extravagant and reckless industrial expansion, we are clearly entering an age of economic scarcity. While human demands continue to rise, natural resources, especially the non-renewable kind, become harder to find and more expensive to extract, process, transport and distribute. This simple brute fact is the basic cause of inflation, despite the inability of most professional economists to see it. (The "dismal science" has never been more dismally obtuse than it is today.) The law of diminishing returns is coming into effect. Technological developments can delay the process but not halt or reverse it; nor can we rely on government or big business to save us. Planning for further growth delays the adjustments that must be made, makes a fair sharing of necessary sacrifices more troublesome, and if carried too far will make more severe and painful, because rapid, the inevitable decline of the international economic machine. The best way to deal with the end of affluence is to accept it — not fight it — and to begin, here and now, the unavoidable adaptations, on an individual, family, and community basis. Piecemeal, experimental, and muddling.

This of course is the conservative approach to the future, conservative in the true, honest, root meaning of the word, and will be dismissed with impatience by those who still yearn for dramatic breakthroughs, global industrialism, a planetary state under the domination of Capitalism or Communism or some convergent combination of the two. We need heroes, the critics will cry, bold and giant figures — tragic heroes! — who will lead us on to ever grander adventures, up to the pyramids of power and beyond — ad astra. To the stars.

Anticipating this objection, Mr. Johnson offers us the comic hero. The tragic hero is always willing to risk everything (including our well-being) for his vision of the ideal. Modern history gives us numerous examples of the type. The comic hero, however, is more concerned with survival. Survival in comfort. Good food, adequate shelter, a decent wine, the love of wife and friends and neighbors, a satisfying job, a supportive community to live in, these comprise for the comic hero the essentials of a good life.

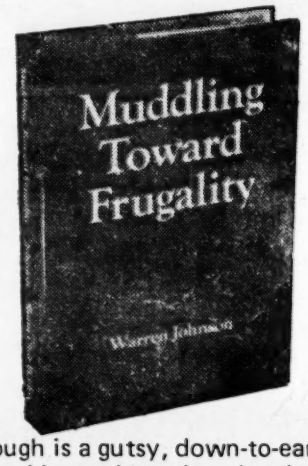
The comic hero is a muddler. He makes a science of muddling, that is, of feeling his way step by step through problems that allow no bypassing and cut off retreat. He is satisfied with small gains and willing to make small sacrifices. He distrusts abstractions, grand generalizations, all-embracing ideologies. When possible he dodges war, whether a war against another nation, another people, or against nature. He is ready to adapt and change when necessary rather than cling with loyal desperation to any cause, however traditional, that is clearly getting him into more and more trouble. He is ready, among other things, to give up his gas-hog pickup for a bicycle, his cross-country vacation tour for a walk in the hills, his color TV for a ballgame in the park, when the advantages of so doing become apparent. And he has enough foresight to surrender a job in a doomed industry — automobiles, for example — when a chance appears to make a living elsewhere. Before it is too late. Before he is trapped.

None of these ideas may seem new. They are not. Most good ideas are as old as humankind. The value of Mr. Johnson's book lies in his synthesis of several old ideas — voluntary simplicity, for example, and friendship, and community citizenship — in a sensible program for an entire nation. He does not propose to save the world. The rest of the world, as he makes clear, must save itself, and in this endeavor, as he points out, the so-called under-developed lands have in some respects a head start against the over-developed lands such as the United States. The majority of the people of Mexico, for instance, are well accustomed to poverty; if they can find a way to bring their population into balance with their land and its resources, and learn to share those resources in an equitable manner (through another revolution, if necessary), they will be better off than we North Americans, for whom frugality and commonwealth remain exotic, dangerous heresies.

Muddling Toward Frugality *is a hopeful book, despite its title. Mr. Johnson shows in what I find a persuasive argument that if we have enough time, and if we begin to change our ways now, voluntarily, with patience, good humor and good will, we can not only avoid calamity but even regain a saner, easier, more rewarding way of life. It is too late to return to the lost Eden of a hunting and gathering tribe — there are far too many of us — but not too late to work out a reasonable compromise among the various possibilities of science, technology, democratic culture and agriculture. We might even find ways to create a society of humans worthy of the name of civilization. There is always hope, and where there's hope there is life.*

—Edward Abbey

Muddling Toward Frugality
Warren Johnson
1978; 252 pp.
$6.95 postpaid
from:
Sierra Club Books
c/o Book Warehouse, Inc.
Vreeland Ave.
Totowa, NJ 07512
or Whole Earth



The process of muddling through is a gutsy, down-to-earth process full of inefficiencies and inconsistencies. It takes an inordinate amount of time to take modest incremental steps forward, and significant bold steps are clearly not in the cards. The process can be a lot of fun for those who enjoy it and do not take themselves too seriously — the politician who loves to talk to people, the lobbyist who thrives on finding ways to gain access to the influential, or the activist who enjoys organizing people. It keeps this country pretty close to the middle of the road, while still permitting slow, faltering adjustments to change. All the jibes about our political process seem pretty appropriate. Ralph Waldo Emerson said democracy was "a raft which would never sink, but then your feet are always in the water." E.B. White defined it as "the recurrent suspicion that more than half the people are right more than half the time." I rather like Plato's definition of democracy as "a charming form of government, full of variety and disorder, and dispensing a sort of equality to equals and unequals alike."

The Pendulum and the Toxic Cloud

This volume of Whiteside's recent articles on dioxin (TCDD) contains an excellent summary of nine years of administrative, legislative and largely political juggling of an issue vital to the health of present and future populations: the "rights" of corporations — under protection of limited liability — to disseminate potent, long-term toxins into the environment and food chain of people who are powerless to control them. Using Seveso, Italy as a blatant example, he examines the political manoevering, social and economic pressures, manipulation of the media, and extensive cover-ups that industry employs with impunity and profit. Of course Seveso is not an isolated incident: numerous American and European examples demonstrate the same dominion of power, politics and corporate wealth over the rights and health of individuals.

The book is amply and thoroughly documented: the bibliography and appendixes make it well worth reading even by those who have already read the bulk of it in the New Yorker.

—Carol Van Strum

The Pendulum and the Toxic Cloud
(The Course of Dioxin Contamination)
Thomas Whiteside
1979; 205 pp.
$4.95 postpaid
from:
Yale University Press
92A Yale Stn.
New Haven, CT 06520
or Whole Earth

PIG IGNORANT:

WHO IS OPTIMISTIC?

Jean-Francois Millet

Not the man with a hoe.

BY PETER LAURIE

As Pig taps out these unpretentious lines, he sits looking onto a grey scene. That scene is, or rather would be, if one could but see it, the Dorset countryside. Today, and for many days past, it has been wrapped in cloud. The contents of the cloud fall unceasingly on the earth beneath – often not bothering to unfreeze themselves, so that from time to time the wind throws a handful of deafening hail against the quaint diamond panes of my Victorian Gothick cottage. It has been the hardest winter for a century. In a country which has natural disasters properly under control, we were not pleased by the sea's determination to abolish a neighbouring village on the island of Portland. Twice sou-westerly gales hurled waves over the Chesil Bank, that twenty miles long, curving beach in the middle of England's south coast, and on the third occasion – a few weeks ago – in the middle of a calm evening, the sea gathered itself into a sixty-foot high hill, walked over the beach, over the sea wall, and demolished the entire place. There was no call for it. It was unnecessary.

Peter Laurie, late of the **New Scientist**, *writes from within the British experiment.*

–SB

It is a winter that makes Pig very glad that some years ago he was not seduced into reuniting his soul with the Land. For Dorset is full of people from London who are sick of the falsity and hypocrisy of city streets and have come here to do something *real*. They are egged on by a very bad man called Seymour who makes a lot of money writing pretty books about self-sufficient farming. His books show you calm, wise, pastoral girls making withy baskets to hold the dozens of eggs their chickens yield. Grave but merry bearded men plough the land behind dear old Dobbin, confident that the earth will yield her increase in due season. Seymour tells them that a man and his family can live – and live well – on an acre and a half. Look at the vegetable garden! See the pretty cabbages! See the carrots, see the brussels sprouts! And all free, my children, save for a little healthful labour, a little dirtying of the hands with God's good earth.

Do not see the eelworm, the greenfly, the ringworm, the staggers, the botts, the lambs that are born rotten, the calves that live a miserable week scouring and

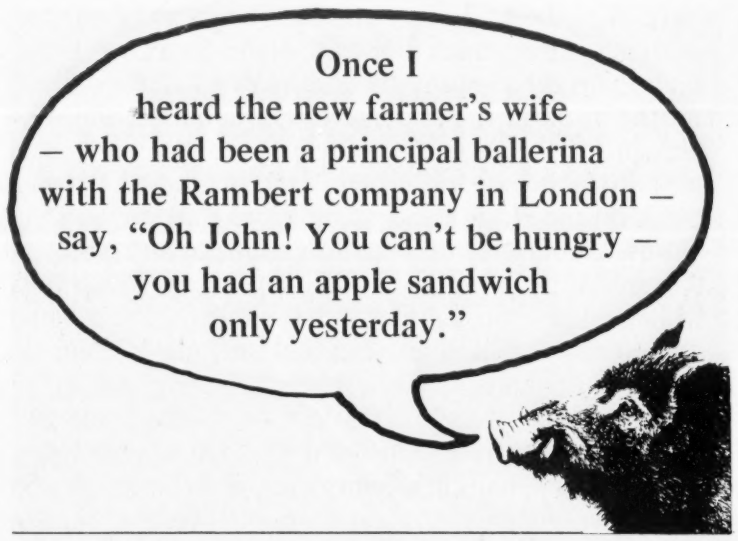
stumbling, and die in convulsions. Do not ask why the crabbed arthritic little people from whom you bought your acre and a half for sums of money unprecedented in the history of British land prices, run off chortling and skipping, as fast as they can to London. They have spent a lifetime on this wet, acid, ungrateful land. They know that an acre and a half of it will not make you rich – no, nor a hundred acres and a half either.

To make a living from farming you need three hundred acres, which will set you back very near a million dollars. (British farms are very productive, and traditionally, people who make money in the city become gentlefolk by buying land. Hence these ridiculous prices). If you have less land, you work it less efficiently, you are in competition with the big farmers, so you have to sell your products for less than they cost you to grow. Ah, say Seymour and the self sufficients, we *don't* sell. We eat what we grow!

There are two snags to this: few farms raise good crops of: alcohol, salt, shoes, books, music, soap or toothpaste. If you are not to live like a mediaeval peasant you need money to buy these things. Secondly, you will raise calves and lambs – often feeding them by hand, struggling for their lives. They become your friends. If you are to eat meat you have to kill and devour them. It did not worry mediaeval peasants, but it will worry you.

I was lucky enough to experience these problems vicariously. I have two friends, one rich and the other poor, who went into small farms about ten years ago. The rich one bought a vertical bog – you don't believe me? Half his farm is so steep that you have to pull yourself up by clinging to trees. Yet water gushes out of the ground so copiously that you must wear fisherman's thigh boots. It grows tier after tier of wild orchid and scrubby pine. It grows very little that anyone but a woodpecker can eat. His animals get foot rot by standing all their lives in a marsh. Or else they fall down the hill and break their necks. But since he is rich, he can solve these problems by writing a cheque – and there are tax advantages still to being a farmer, so he is not altogether worse off. But you would have to describe him as 'Self Deficient.'

The poor one bought quite a good little farm from a man who had gone bankrupt and needed the money too desperately to wait for a better offer. He learnt how to farm well with no capital. He bred the local sheep, the Dorset Horn, an odd breed which will lamb in November to produce fat lambs for the market in April. Since ordinary sheep are just having their babies then, you get good money for young Horns. But – but, it means a winter of struggling with these little animals, trying to keep them warm and fed when all of nature intends the opposite. In the ten years my friend did this he aged thirty. He arrived gay, lithe, cheerful, handsome. When he finished he was stooped, lined, gray. For three years, while he was learning how to raise sheep, he and his wife and daughter never ate meat. Once I heard his wife – who had been a principal ballerina with the Rambert company in London – say, 'Oh John! You can't be hungry – you had an apple sandwich only yesterday!'



It was a thought provoking spectacle. As the winters rolled by, and all I had to do was sit in a nice warm room typing a few well-informed and witty sentences, I thought of John slithering on the icy mud with less envy. Even on golden summer evenings I learnt not to envy him. For he would look from his front door onto a golden ampitheatre of fields. I would, on the occasions I was there, see only beauty; he would see a field that needed draining at the cost of five thousand pounds, a ley of grass for hay that was not coming on fast enough, a hedge that needed fencing. With binoculars we would watch the mother fox teaching her cubs to hunt on the other side of the valley: for me it was an amazing privilege, for John a warning that they would be hunting his new lambs next winter at a cost of sixty pounds a bloody head.

It turned out all right in the end. Land prices had gone up so much in the time he was there that he was able to sell the farm for eighty thousand pounds that he had bought for twelve. He dyed his hair, bought some mascara, a purple scarf and a new Porsche, and went off to New York where he met Sid Vicious (alas, now deceased). His wife makes a fortune teaching ballet, a commodity much in demand in those parts.

And I take my afternoon constitutional past fields that someone else has to drain and plough and harrow. They must try and out-guess the bureaucratic bastards in Brussels who set European farm prices. They must worry about the foxes and the blight: owing to the political power of the French and German peasant, I can turn my typing into food at such an advantageous rate that I would be crazy to lay hand to harrow. I have even given up trying to talk intelligently about it all. A few years ago I could tell ewe from hogg from wether. Now they just look like sheep – or are those animals called cows? More cassoulet anyone? Try this Montrachet – I think you'll like the bouquet.

Well, it is not really about money. It is about optimism, and the reason I have gone on at such length is that the land – which once seemed an inexhaustible source of optimism – has proved to be a false jade. Her service condemns one to a narrow, debilitating life. The 'nature' that obtains on farms – even on self-sufficient ones, which are clumsy reproductions of mid-nineteenth century agriculture – is about as

natural as the hydrogen bomb. The great invention of agriculture, which eight thousand years ago freed man from the tyranny of finding every day's dinner on the hoof, at the expense of condemning ninety percent of the people to wizening labour, has now, in its turn, been vanquished. Hardly anyone needs to work on the land in the west: those that do, will only choose to because they cannot think of anything better. And that is what this piece is really meant to be about – though it got sidetracked. What can one do about which one can feel optimistic? Very little. My friends who consider themselves artists – either with brush or word – can only keep their spirits up by whistling in the dark. Those who went into industry, banking, commerce feel themselves on a slope as unstable as my rich friend's vertical marsh. Journalists report non-news about non-events to readers who care nothing about either. Ecologists are staving off disaster.

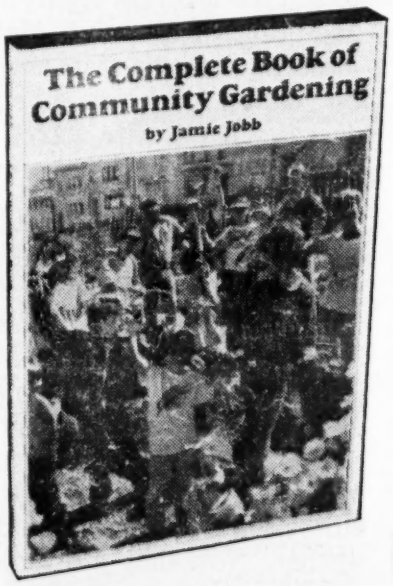
Whom do I know who seems optimistic? There are not many. Archaeologists are, for they bury themselves in a past whose outcome is known – they are warm, comfortable, secure. Physicists are because the safe door which protects nature's secrets is beginning to cave in. They cluster about the vault, blasting the locks with psi meson beams, peeking inside with lasers, waiting eagerly for the moment when the whole universe will turn inside out like a glove. Molecular biologists are because they can feel the secret of life begin to stir under their hands. They will, they think, soon be as God, the giver of life. Computer people are because the gallop of their technology will soon put the whole of man's social life: his commerce, his business, his arts, his literature into their hands. And more: they will be able to encapsulate the seed of intelligence in their chips and release it from the inching of evolution. It took two hundred million years to get us here: in maybe a thousand more man will be done for, and the vital spark he nourishes so dimly will be on its way alone, unemcumbered by the flesh.

As I said, it is a cold late Spring. Mid-April and there are no buds yet on the trees. ■

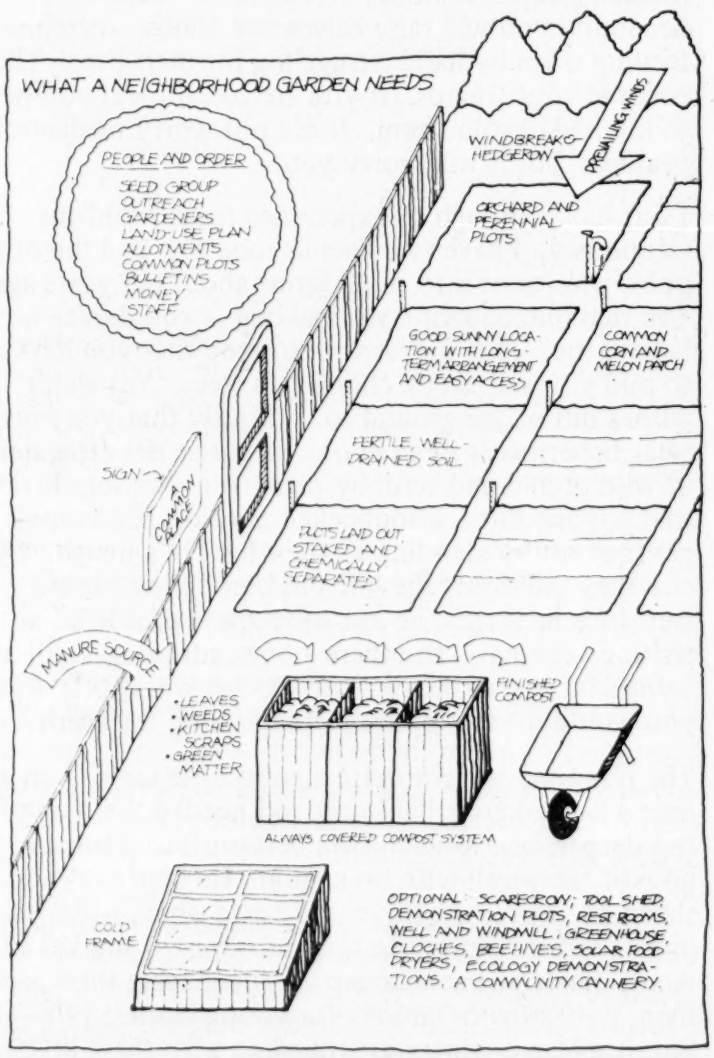
The Complete Book of Community Gardening

Community gardening's most interesting aspects are covered in this warm-hearted book – the wide variety of people involved, the nooks and crannies and open fields they find to grow their food in, and the techniques that evolve when people of different ethnic backgrounds garden together. Author Jamie Jobb documents community gardening by describing how people do it from coast to coast – including detailed annotated lists of seed sources, organizations, publications, etc. A unique and valuable chapter illustrates common families of plants. Celery, carrots and dill are all members of the parsley family; asparagus and aloe are lilies. Groups of plants and groups of people come together in community gardens.

–Rosemary Menninger



The Complete Book of Community Gardening
Jamie Jobb
1979; 185 pp.
$7.95 postpaid
from:
William Morrow & Co., Inc.
Wilmor Warehouse
6 Henderson Dr.
West Caldwell, NJ 07006
or Whole Earth



Guerilla Gardens

America has more vacant and abused lands than it has people who are willing or able to cultivate them. But there is one good way to put this land to use and make it productive. The secret is to broadcast-sow vacant lots with seeds of mother weeds and hearty cultivated plants so their dynamic qualities and aggressive root action can renew the land. Later these vacant lots could be used by neighborhood garden groups like yours or others. Or they can be left alone to grow and spread their wings as bona fide weed patches.

Seeds from any of these wild and cultivated plants can be used to start a guerilla garden. Simply break the soil a bit and then toss the seeds:

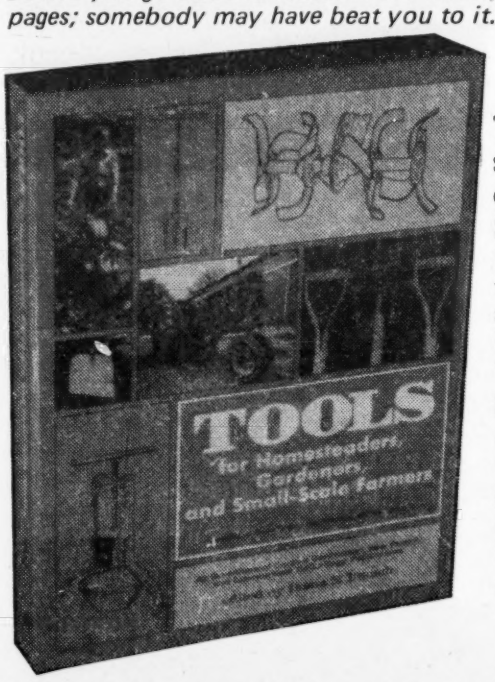
fava beans	vetch	goldenrod
clover	alfalfa	nasturtium
lupines	borage	flax
black nightshade	ground cherry	plantain
cherry tomato	cayenne pepper	shepherd's-purse
dandelion	sunflower	milkweed
cosmos	wild lettuce	lamb's quarters
marigold	Shasta daisy	stinging nettle
sow thistle	curly dock	burdock
sheep sorrel	cocklebur	amaranth
smartweed	mustard	rye

Tools for Homesteaders, Gardeners, and Small-Scale Farmers

If you live in the country and raise food, get your hands on this catalog. No rural town or county library should be without it. Rodale has taken John Boyd's work for Intermediate Technology Publications on appropriate agricultural tools for the third world, and added a very comprehensive listing for American-made tools, old and new. Access to dealers, foreign and domestic, is included. Chapters on hand tools, tractors, tillers, cultivating implements, planting and harvesting equipment, threshers, and more, all illustrated. A healthy respect for the farmer as tinkerer and recycler of old machinery is shown throughout.

Before you go out and reinvent the wheel, flip through these pages; somebody may have beat you to it.

—Richard Nilsen



Tools for Homesteaders, Gardeners, and Small-Scale Farmers
(A Catalog of Hard-to-Find Implements and Equipment)
Diana S. Branch, Ed.
1978; 512 pp.
$12.95 postpaid
from:
The Rodale Press, Inc
33 East Minor
Emmaus, PA
18049
or Whole Earth

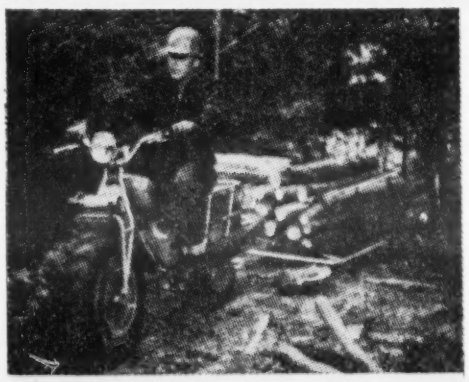
Throughout the compilation of this book, we have selected the tool over the machine. . . . Tools humanize; machines dehumanize. Tools make unique products — each a little different from the other, each speaking eloquently of the tool's user. A machine deals in multiplied sameness no matter who or what operates it. The best machine operators are other machines. . . .

•

A large percentage of our inventors came from rural communities, and virtually all the industries which grew up in the United States in the 1800s started on a very small scale, often as one-man operations. Cyrus McCormick, Oliver Evans, Eli Whitney, even Henry Ford — each grew up on a farm. The inventors of tools we still need will most likely come from the ranks of today's small farmers — and their children.

•

A conversation with a Technical Assistance Official for Africa revealed that "the Mototractor could well be the sole piece of technology developed in the United States with significant implications for emerging nations. It is extremely strong and has few moving parts. . . . It has all the attachments of a small-farm, utility tractor — plow, cultivators, trailer, and spraying and irrigating equipment — is able to transverse two-foot streams, has wide tires for superior traction in mud, has a ten-horsepower gasoline engine and power take-off shaft, can climb 45-degree inclines, and has a maximum operating speed of 40 miles per hour.

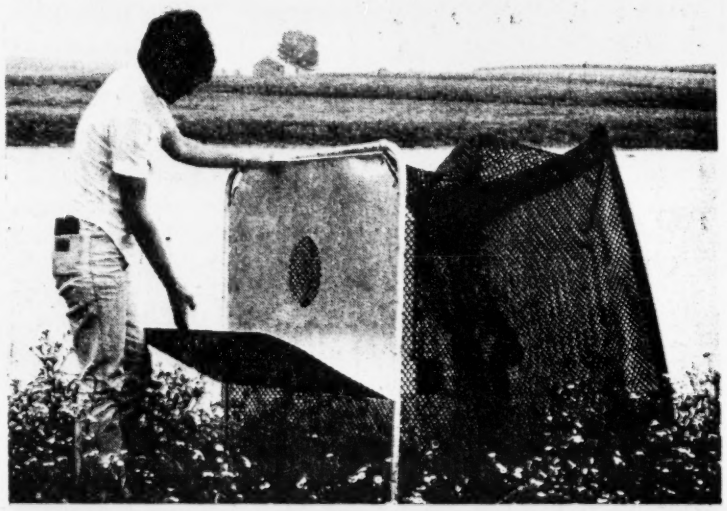


Rokon, Inc.
American Engineers & Manufacturers
160 Emerald St.
Keene, NH 03431

Mini Nibex Planter

The Mini Nibex hand planter is for growers with up to 10 acres and will sow up to 2 acres in a day. The Nibex cup system includes 25 types of cups for different seeds — both natural and pelleted. This wide range makes it possible to be able to choose the most suitable cup for the desired drilling method. The seeding rate can be varied from 4 to almost 2,000 seeds per running yard — either thin-line or band-drilled in widths of 2, 2.5, or 4 inches (50, 65, or 105 millimeters). The cup system is largely unaffected by variations in seed size. To reduce the amount of seed required when sowing small and expensive seeds, a regulator-economizer insert is available for use in the seed-housing unit.

Nibe-Verken AB
S-285 00 Markaryd
Sweden



Cage Culture

There are many advantages to raising fish in cages. Cage confinement means fish can be grown in streams and rapidly moving water without any fear of losing them to the natural environment. Feed waste is greatly reduced since the feeding is concentrated in a very small area. Because the movement of the fish is restricted, they do not need much feed to survive. They just eat and grow! Monitoring fish growth and health is greatly simplified, and the threat of predators is reduced. For a 100-percent harvest, the cages are simply lifted from the water — no fishing, draining, or seining (harvesting with a drag net) is necessary.

Double-Q Fish Cages

Inqua Corp.
P.O. Box 1325
Homestead, FL 33036

WATERSHED UPDATE *by Peter Warshall*

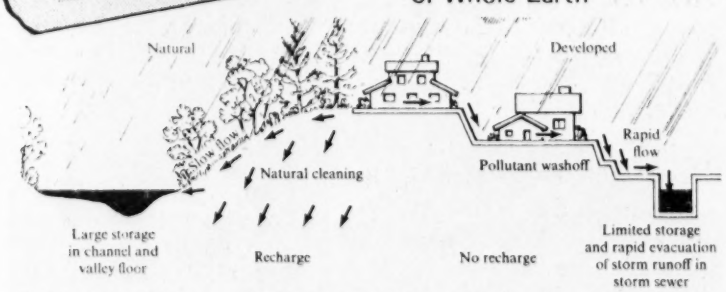
Until an introductory book discussing watersheds as the most sensible unit to discuss Nature's food web and human planning is written, we are left with pieces of the puzzle. Here are some of the best pieces published or discovered during the last year.

Water in Environmental Planning

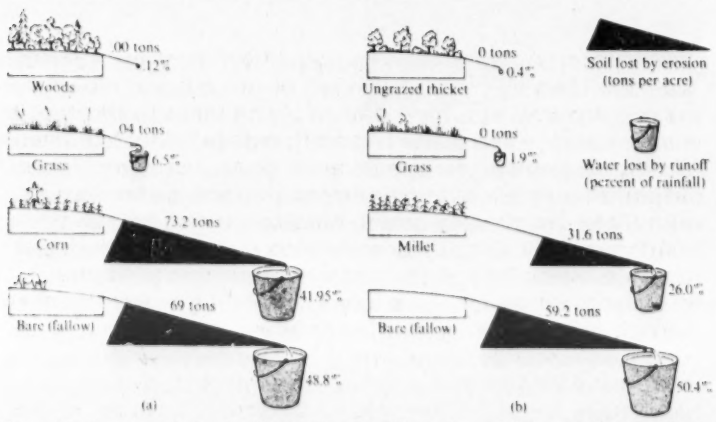
This is the watershed text. A diamond of the first water. Dunne and Leopold wield the swords of Reason and Science, insisting on quantitative thought. Not just "It rained"; we must say: "A two-hour light rain (that's 1/10" per hour) that caused little overland flow." The book is required reading for those plunging into the nitty-gritty of Environmental Impact Reports; regional or local planning; fighting or supporting subdividers and developers; teaching about flood hazards, rotational slips, stormwater and groundwater overdraft. The writing is rationalist (citing sources, latinate, metrics and lotsa techno lingo). But, taking your time, eddying around in the paragraphs, is always instructive.

(P.S.: No book is perfect. **Water in Environmental Planning** *is weak on water quality (no discussion of rain quality or cloud seeding, for instance) and no quantitative examples of balancing nutrient budgets (a problem frequently encountered when sewage is discharged into lakes). The section on septic tank systems is so broad as to be bad advice (one picture is described falsely in the text). Large-scale water transfers are not given much attention though they are central to U.S. water planning. The effects of water planning on vertebrates (e.g., conflict between riparian vegetation as habitat* vs. *drain on agricultural water supply) are not discussed. A greater focus on the "watershed ecosystem" would greatly benefit environmental planning. This book is a great leap forward. We need to keep on leaping.)*

Water in Environmental Planning
Thomas Dunne and
Luna Leopold
1978; 818 pp.
$30 postpaid
from:
W.H. Freeman & Co.
660 Market St.
San Francisco, CA 94104
or Whole Earth



Schematic representation of problems to be managed in the control of urban storm runoff.



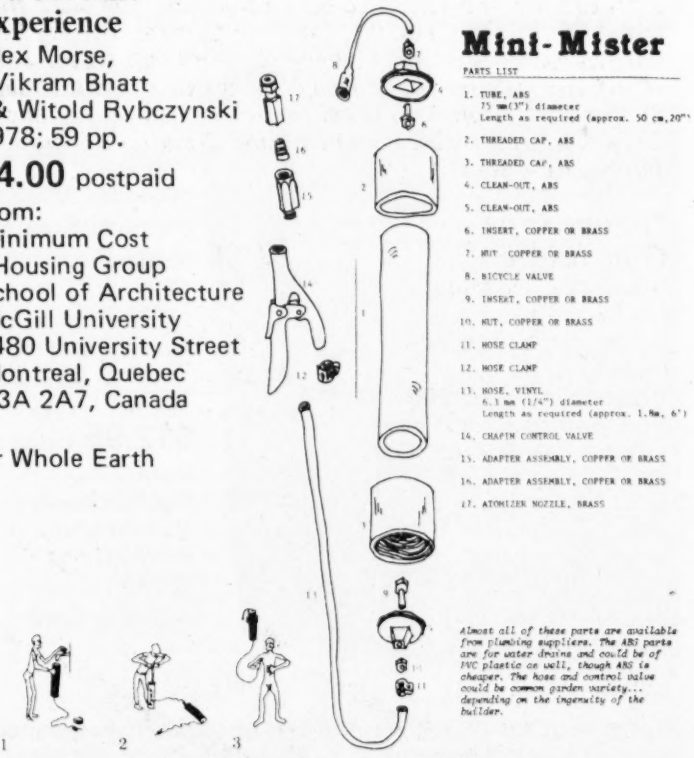
Results from plot studies of runoff and erosion under various types of land use. (a) Midwestern United States. (Soil Conservation Service.) (b) Mpwapwa, Tanzania.

Water Conservation and the Mist Experience

An eccentric and delightful pamphlet on the water savings achieved by washing with water mists and sprays. All you want to know about nozzles and hygiene.

Water Conservation and the Mist Experience
Alex Morse,
Vikram Bhatt
& Witold Rybczynski
1978; 59 pp.
$4.00 postpaid
from:
Minimum Cost
Housing Group
School of Architecture
McGill University
3480 University Street
Montreal, Quebec
H3A 2A7, Canada

or Whole Earth



How does it feel to use an atomized shower?

The atomized shower produces a different sensation from the normal shower. Although the device is similar to the telephone shower which can reach close to all parts of the body, the spray impact is much less, so the needle-like massage is missing and a softer flow of water is felt since the droplet size is finer. During rinsing, the soap comes off more slowly and sometimes must be wiped off with the help of a cloth or sponge since the weaker impact spray does not move the suds as fast as with the normal shower. But on completion, one has the same exhilaration and clean feeling as after the normal shower.

Perhaps it could best be compared to a gentle rain in contrast to a driving rain.

Land Use and the Pipe

Is your town being asked to sewer up? Buy this book. Hold a workshop on each chapter. Then, hire the engineers and apply for the grants. **Land Use and the Pipe** *says what's crucial: the difference between a sewer, the sewage that flows in the sewer and the sewerage system. It provides the solid intelligence needed to avoid sleazo engineer bamboozlement: costs, slopes and soils, and affects on housing growth of varying sized trunk lines. What my* **Septic Tank Practices** *does to keep on-site sewage systems,* **The Pipe** *does to develop sensible collection systems. If only this book had been available when my town . . .*

Land Use and the Pipe
(Planning for Sewerage)
Richard Tabors, Michael
Shapiro and Peter Rogers
1976; 182 pp.
$15.50 postpaid
from:
Lexington Books
D.C. Heath & Co.
125 Spring St.
Lexington, MA 02173

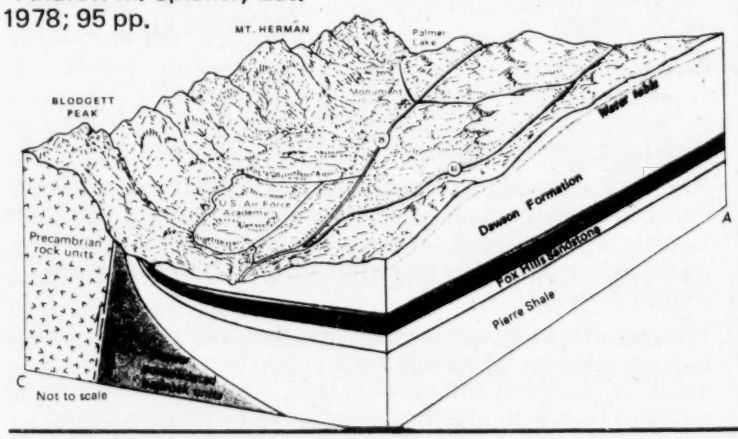
"Nature to be Commanded . . ."

One of the great frustrations of trying to create an educational book about watersheds is mapping. For instance, in black-and-white, you can use stipples for sand, squares for bedrock, black for clastic dikes and then try to overlap these three textures with a ripple pattern for subterranean waterflow. The result: a difficult mish-mash of criss-crossed lines. One yearns for a blue overlay.

Well, one thing the government can do is print huge four-color maps and photos and sell them dirt cheap. **"Nature to be Commanded . . ."** *(terrible title) is a best buy. Fine vignettes of land and water problems throughout the United States and how mapping and resource planning are essential tools to prevent disasters to both people and the place they inhabit. Vignettes include: Land-use Controls Arising from the Erosion of Seacliffs; Landsliding and Fault Movement (California); Water Use in Long Island (New York); Gravel Mining and Resulting Ground Instability (Colorado); and Groundwater Resources and Housing Growth in Tucson. Boring prose style.*

"Nature to be Commanded . . ."
(Earth-Science Maps Applied to Land and Water Management)
Geological Survey
Professional Paper 950
G.D. Robinson and Andrew M. Spieker, Eds.
1978; 95 pp.

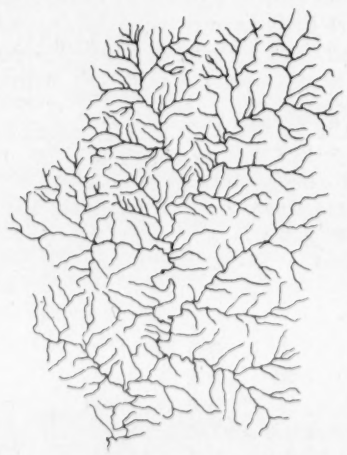
$7.00 postpaid
from:
U.S. Gov't. Ptg. Office
Supt. of Documents
Washington, D.C. 20402
or Whole Earth



Guidelines for Watershed Management No. 1

When you're down in the dirt and soiling your hands, this book is the best guide to watershed healing of erosion scars and gullied hillslope wounds. Fine technical essays with lots of equations and equipment by such watershed doctors as Thomas Dunne ("Evaluation of Erosion Conditions and Trends") and B.H. Heede ("Gully Control Structures and Systems"). For all those in forested watersheds that have been sloppily logged with thoughtless roads, this book is a must. For all those living in agricultural watersheds with problems of soil loss, this book will sparkle ideas. (Ask for complete list of related FAO publications when ordering.)

Guidelines for Watershed Management No. 1
Food and Agriculture Organization of the United Nations
1977; 293 pp.
$12.50 postpaid
from:
Unipub
Box 433
Murray Hill Station
New York, NY 10016
or Whole Earth



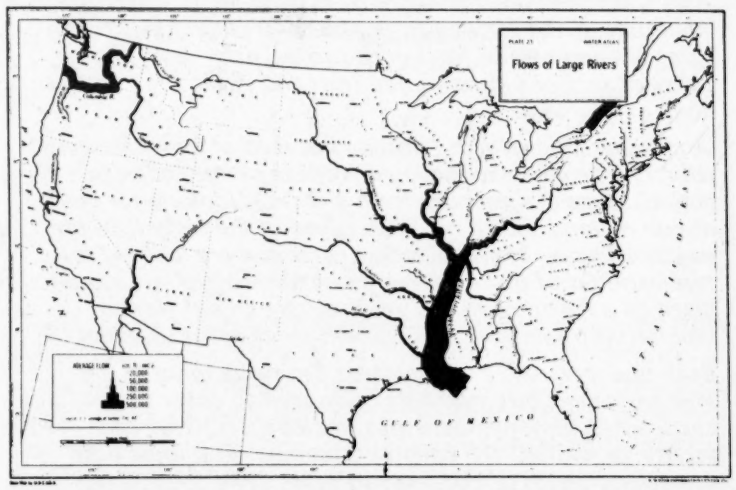
The Drainage Network of the Kickapoo River

Water Atlas of the United States

A lovely way to spend cozy evenings, looking at the straightforward, easy-to-read maps on every aspect of water: Fishable Freshwater Areas; Withdrawal of Water for Air-Conditioning; Natural Flouride in Water Supplies; Depth of Frost Penetration, etc. — 122 maps. Gives a comforting or uncomfortable perspective on the uniqueness of your local watershed and water cycle and how human tampering with water resources has changed the place where you live. (Ask for complete list of Water Center's publications when ordering.)

Water Atlas of the United States
(A Water Information Center Publication)
Geraghty, Miller, Van der Leeden, Troise
1973; 122 plates
$40.00 postpaid

from:
Water Information Center, Inc.
7 High Street
Huntington, NY 11743



Recovery and Restoration of Damaged Ecosystems

A broad view of land and water healing by the university crowd. Some essays are brilliant (especially Bob Curry's "Reinhabiting the Earth") and some sluggish. A welcome collection of thoughts about just how much watershed (especially lake, river and estuary) healing can occur and what the healing of damaged Water, Soil and Nutrient Cycles means to industry, the ecologist, the recreationist and the government agency.

Recovery and Restoration of Damaged Ecosystems
J. Cairns, Jr., K.L. Dickson, and E.E. Herricks
1975, 1977; 531 pp.
$20.00 postpaid

from:
The University Press of Virginia
Box 3608 University Stn.
Charlottesville, VA 22903
or Whole Earth

An understanding of the recovery of damaged ecosystems, whether damaged by man-caused perturbations or by natural events, can lead man to a philosophical reinhabitation of the earth — within the balances and dynamics of its ecosystems. Today we see this philosophical reinhabitation manifested in a natural philosophy of low-energy, nonconsumptive lifestyles practiced by a few and espoused by many. This "future primitive" philosophy demands a very high degree of understanding of those ecosystems upon which one chooses, deliberately, to become reliant. A regional sense of identity places man within those ecosystems that he inhabits or otherwise relies upon directly and forces a balanced use of ecosystem resources. Such biogeographic identity demands a sound understanding of response of ecosystems to stress.

—Robert Curry

Water notes

Alternative Systems. Free. Twice yearly from the Office of Public Affairs, State Water Resource Control Board, P.O. Box 100, Sacramento, CA 95801.

California's trying to handle the sewage rebellion that went outlaw between the 1960s' "green out" and the 1970s' drought. There are so many greywater systems, outlaw dry toilets and small towns refusing to sewer up that sluggish bureaucracies have had to take note. This leaflet tells what California government is trying to do – how they hope to absorb the rebellion into their administrative control. It's informative.

American Clean Water Association. 1341 G Street, NW, Suite 200A, Washington, D.C. 20005.

A new organization filled with the wealthier superstars of sensible wastewater treatment and recycling. Their purpose: to promote clean water by making appropriate technology a good business. Board of Directors include a marketing manager for spray irrigation equipment, the environmental director of Campbell Soup Company (which recycles soup by-products to grow more soup), Abby Rockefeller of Clivus reknown, et al. A strong coalition of heavies trying to stop purposeless technomania. They have a newsletter ("The Friday Morning Letter") which updates problems and projects of American water and wastewater management. Corporate or institutional membership: $1,200. Individuals: $100. Tax deductible.

Septic Tank Practices: A Guide to the Conservation and Re-use of Household Wastewaters, by Peter Warshall. 1979; 180 pp., $3.95, available from Doubleday & Co., Inc., 501 Franklin Ave., Garden City, L.I., NY 11530, or Whole Earth.

Just announcing my new expanded edition – no longer homegrown but straight off the ancient presses of Doubleday/Anchor. I still enjoy your letters and questions so continue to write.

–Peter Warshall

Seed Savers Exchange

The Seed Savers Exchange (formerly the True Seed Exchange) offers home gardeners an opportunity to play around in their back yard gene pool in hopes of expanding its diversity. Members of the Exchange, hundreds of them from North America and several foreign countries, offer seed to each other of rare or old-fashioned fruit and vegetable varieties they have grown.

A member from North Carolina has seed of a melon-squash which he believes was brought from the West Indies in colonial times; a member from Kansas is looking for seed of cob melons, which his folks raised in the early '30s in western Texas. Many members offer and are looking for rare varieties of beans; a man from Missouri offers a bean given to a friend of his 40 years ago by an old Navajo woman who said they were grown by the cliff dwellers.

Both members and non-members can participate in the seed exchange, but members trade seed to cover the postage costs, while non-members must include $1.00 for each seed variety requested. To become a member you must have something (seeds or cuttings) to offer. The Seed Savers Exchange Yearbook lists the members with their offers and includes seed saving information and a smattering of plant breeding news from around the world.

–Rosemary Menninger

Seed Savers Exchange Yearbook for 1979
1979; 40 pp.
$2.00 postpaid

from:
Seed Savers Exchange
Kent Whealy
Rural Route 2
Princeton, MO 64673

Always look at your plants with seed selection in mind. Don't just look at the fruit, look at the *whole* plant. Select several plants to save seed from, not just the best looking or largest one. This will give your seed a greater genetic diversity and is the key to continued evolution and the ability of your plants to adapt to a variety of conditions. Select plants that have the characteristics you want your next years' plants to have. Thus plants that survive a drought or disease or extremely short season, will retain that characteristic. You will want to save seed from your earliest maturing plants of corn and tomatoes and radishes and lettuce, but the lettuce plants you save seed from should also be last ones to bolt (send up its seed stalk). Remember that size and quality are not the only characteristics you can breed into your seeds.

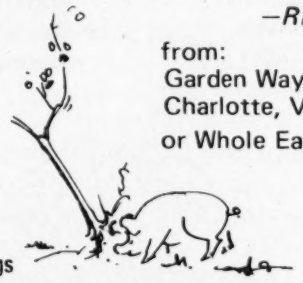
Small-Scale Pig Raising

What Dirk van Loon did for the family cow (see review, Fall '76 CQ, p. 70) he does here for pigs. Most all livestock books deal with pigs, but it is nice to be able to reach for one volume that has everything a beginner will likely need. Excellent illustrations throughout. The photo sequence on butchering is particularly well done.

–Richard Nilsen

Small-Scale Pig Raising
Dirk van Loon
1978; 263 pp.
$5.95 postpaid

from:
Garden Way Publishing
Charlotte, VT 05445
or Whole Earth



Clearing Land with Pigs

Far from discouraging rooting, many people do everything they can to encourage the practice in the course of using pigs to clear and plow land. A thorough job can be done on thicketed scrub land or on old fields that are returning to second growth.

The pigs should be confined so that they will root the enclosed area completely. Moveable electric fences are ideal on the roughest, brushiest and rockiest land. On more open ground portable huts with attached exercise yards may be better.

After two or three weeks pigs will have all but the largest shrubs uprooted. Rocks will be tossed on end where they're easy to roll onto a stoneboat. The larger trees may be unearthed as well, if you "plant" cracked corn, apples or other goodies in crowbar holes poked amongst their roots.

A combination of hogs and sheep may be used to establish pasture on shrubby barrens or reverted crop lands. I've not tried it, but the system sounds reasonable and is sworn to by the person who worked it out in New Brunswick.

He first ran hogs on the barrens (rough, sour and rocky land covered with waist-high shrubs). Once most of the vegetation was dead or well beaten down, lime was spread casually with a shovel. It did not matter if the lime was not well scattered. The pigs finished the spreading.

When winter came and snow covered the area, bales of hay were broken and fed to sheep over the same ground. Hay seed, direct from the bales, or passed through the sheep, sprouted over the rich bed, found once the snows melted in spring.

Weeder Geese

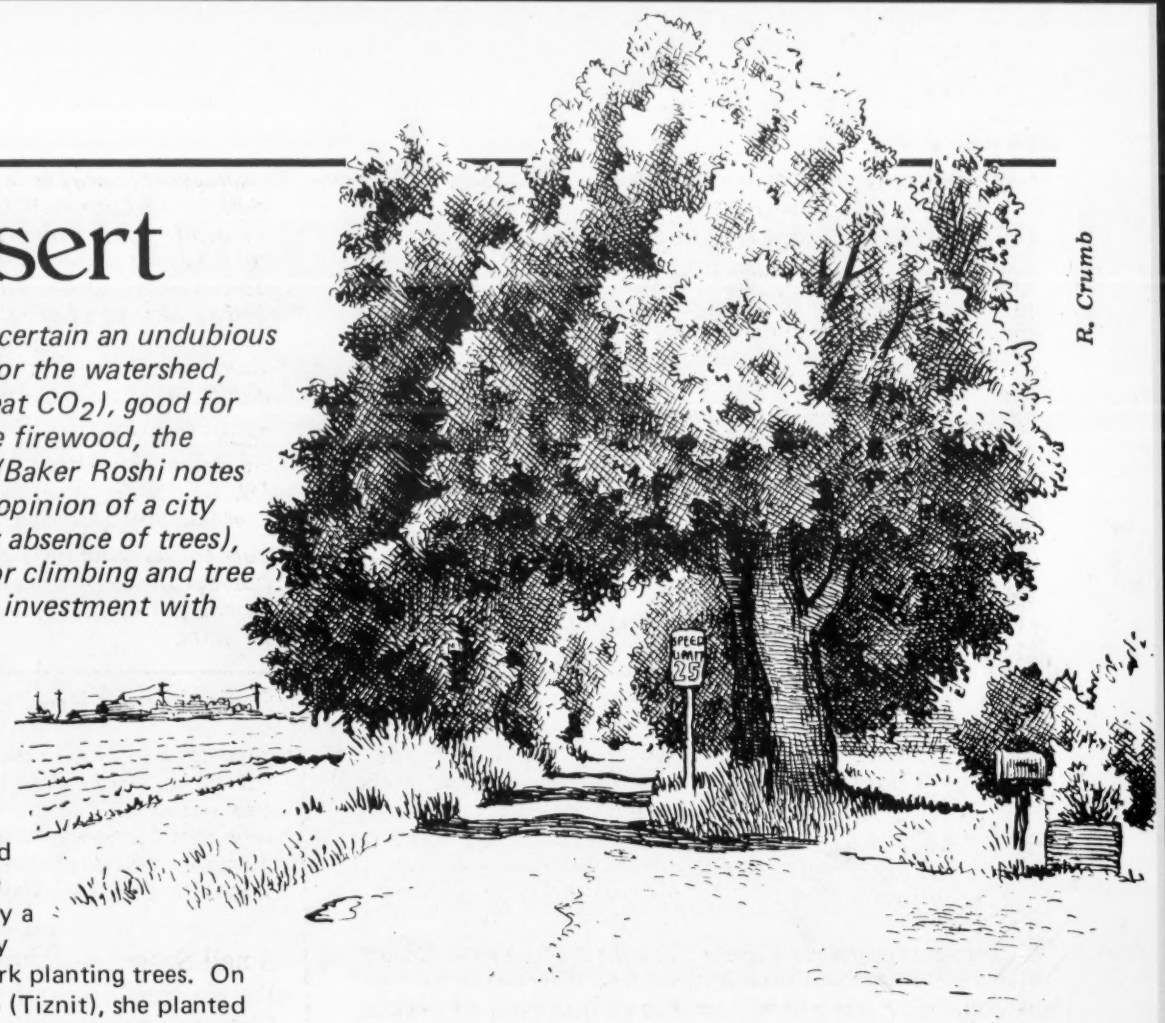
White Chinese Geese are a variety of domestic geese that are excellent grass eaters in row crops, orchards and vineyards. Before the eightfold increase in the last ten years of herbicides on California farms this species of geese played an integral part in the production of a variety of crops. They will control and eliminate Johnson, Bermuda, and Nut grass. They are still used in cotton (mainly), citrus, nuts, stonefruit, grapes, raisins, and tomatoes. Besides being effective in weed control, costs for using geese run about $20 - $30 an acre as compared to $100 - $200 an acre for the same kind of control using herbicides.

John Mason, a greenhouse tomato grower in Barstow, CA finds 2 - 3 geese per acre will do the weeding job of one full-time person. Shipped anywhere in Western United States at day-old stage. $3.00 apiece with $ .50 off for each goose returned at end of year.

–Rich Purvis

Fruit's Weeder Geese
19459 Avenue 144
Porterville, CA 93257

Stop a desert



R. Crumb

Plant a tree — is there any more certain an undubious good? Good for the soil, good for the watershed, good for the atmosphere (trees eat CO_2), good for the shade, good for the fruit, the firewood, the lumber, good for the aesthetics (Baker Roshi notes that nothing so affects people's opinion of a city neighborhood as the presence or absence of trees), good for the continuity, good for climbing and tree houses, a cheap, easy, enjoyable investment with non-stop rewards.

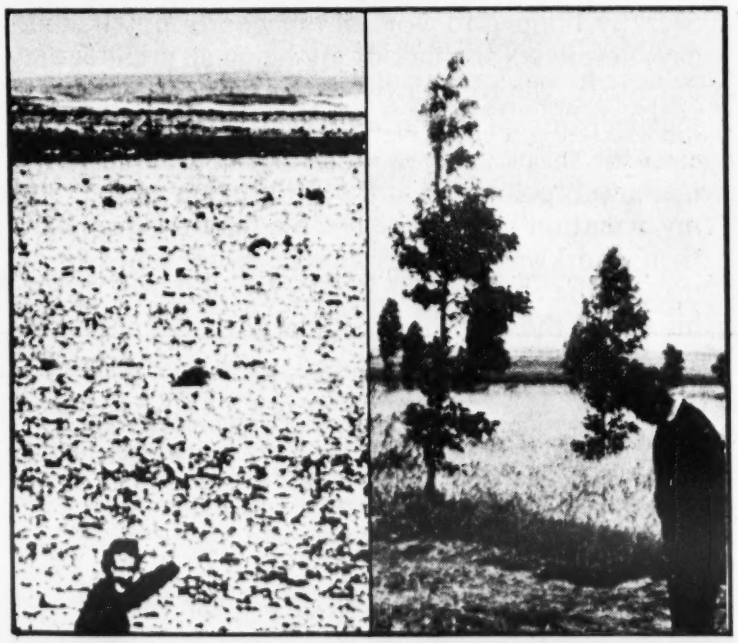
Stop a desert. Plant a tree. (Check this from **Manas**, *March 14, 1979:)*

Twenty years ago an Englishwoman, Wendy Campbell-Purdy, having heard Richard St. Barbe Baker say that the spread of deserts could be stopped by a green wall of trees, bought a one-way ticket to North Africa and set to work planting trees. On forty-five acres of desert in Morocco (Tiznit), she planted 2,000 trees, and four years later they were twelve feet high. She proved that this manmade strip of oasis would change the climate (increase the surface humidity) by growing wheat and barley in the shelter the trees provided. Then she went to Algeria, where a reluctant Government gave her a 260-acre dump. The seedlings she set out there did so well that the astonished Algerian officials promised her help. She went home to England to raise some money, and eventually she formed the Bou Saada Trust to wage biological warfare against the Sahara. A few years later the 130,000 trees she had planted at Bou Saada (in Algeria) were flourishing and the fertile area they created was growing vegetables, citrus, and grain. Plans were then made to invade the great desert with the green things growing.

How urgent is this campaign against deserts? In 1977 a UN Conference on Desertification reported that the world's desert areas are rapidly spreading. One third of the land surface of the Earth is now desert, and every year the Sahara gains 250,000 acres of once-productive land. The lives of some 630 million people are threatened in the regions of the world now turning into desert wasteland.

Wendy Campbell-Purdy has recently formed a registered trust called Tree of Life to continue this project and undertake similar ones. The idea is to save "the vulnerable communities on the fringe of the Sahara and other world deserts by working with them to stop the deadly process of desertification, restore life to the land and protect the livelihood of the people." An explanatory booklet, **Tree of Life** (c/o Coutts & Co., Duncannon Branch, 440 Strand, London WC2R OQS, UK), describes the program:

> The Tree of Life evolved directly from the work of the Bou Saada Trust in Algeria. This successful pilot reafforestation scheme has now been incorporated in one of the world's most ambitious tree-planting programs — the thousand-mile protective "green wall" right across Algeria. The first task of the Tree of Life is to set up similar pilot projects, in cooperation with the Governments concerned, to continue the green wall along the entire northern edge of the Sahara desert.



Before and after tree planting at Bou Saada, Algeria.

Tree stories

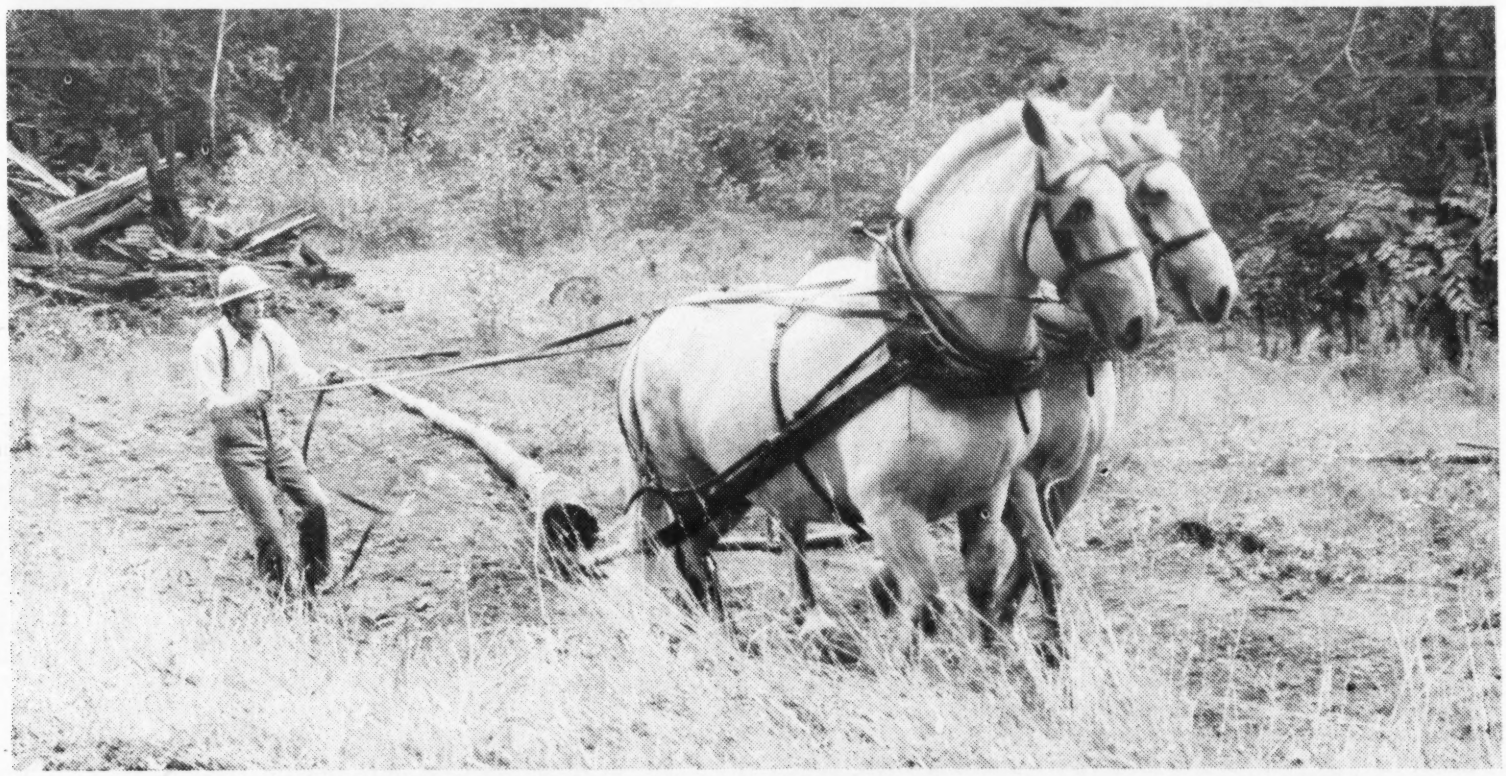
We may be headed toward a CoEvolution Book on trees. There's a couple tree articles and reviews in this issue, more coming later, especially if you send us good stuff.

Thanks to J.D. Smith we used to have a genre in the magazine called "Animal Stories," based on J.D.'s collection of bear stories. Now please, we'd like to collect (and pay for) your Tree Stories.

By way of bridge between the genres, here's Carol Van Strum with one "from my favorite Bronx logger, Mr. Timber, about a faller named Thistle who was cutting into a big old-growth fir when his chainsaw started spouting blood. Turns out there was a bear in the tree. 'What did he DO?' 'Only thing he COULD do, only merciful thing. Keep right on cuttin' . . ."

—SB

Horse logging in Deadwood, Oregon, September, 1977 – one Marvin Cypress driving the horses of one Elmer "Tubby" Beers.



SKIDDING

Horses in the woods: good economics, good forestry – a natural buck.

BY WILL BAKER

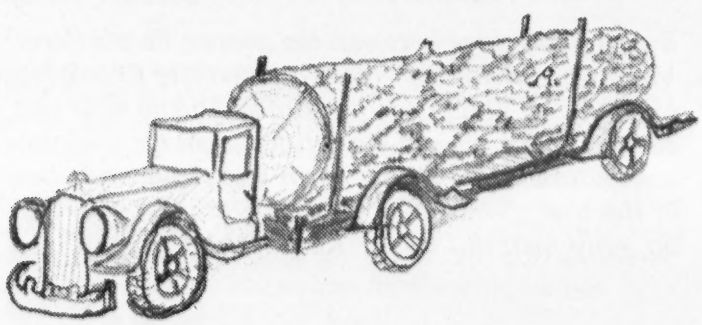
Photographs by Nancy Roberts

Drawings by Will Baker

MY OLD MAN used to point in the family album to the photo of the truck with a single, giant log on the bed. "That's timber," he'd say, and fix me with a hard look. "*That's* a yaller pine. You ever see such a tree, boy?" I'd shake my head and look at my toes. "A hundred feet to the first branch and straight as a string. Country was covered with 'em. Not these modern pecker poles."

He'd stop then and clear out his plumbing. He had a habit of snorting phlegm and tobacco from the deepest and most remote chambers, then pausing to glance around for possible targets. If there weren't any, he did some shifting with his jaw and recycled. My mother used to shut her eyes during this operation and tighten her mouth. Once in a while, if there was special company, she would hiss under her breath: *"Waldo!"*

He paid no attention. Waldo's lecture was about to begin. Or an argument, if there happened to be another adult male present who might presume to know anything at all about wood. I loved the lectures at first, in spite of the boring parts about the big corporations and the dumb apes in the Forest Service, because there would be anecdotes along the way about wild bee trees, hibernating bears, men decapitated by snapping cables, and shooting a bateaux down the white water of the Payette.



Secretly I hoped to work in the woods myself someday, despite all the talk of my being an architect or a dentist. The time or two I bunked with dad in the logging camps, I was utterly awestruck. The chugging cats, the shriek and wail of steel, the toppling of mammoth ponderosa – the whole show magnetized my attention for hours. The old man was foreman then, and I was proud of how he strode and swore, making the engines bellow into life with one wave of his axe. I thought there couldn't be anything more

Will Baker teaches writing and film courses at the University of California at Davis, makes experimental films, raises rabbits and almonds, and has written a novel, **Dawnstone**, *Capra Press, $3.50. His last appearance in* **CQ** *was Summer '77, with a viciously funny story called "Left Over in Your Heart."*

Nancy Roberts and her photographs were sent our way by J.D. Smith.

–Anne Herbert and SB

exciting, since the war was over and fighter pilots were out of work, than belting down those green giants.

LATER, I SAW THE OTHER SIDE of it all. There was a sour streak in the old man that the family traced to his first accident, the year I was born: pelvis, collar bone and six ribs broken when a log rolled over him on frozen ground. Then, when I was twelve, a piggy-back rig jackknifed on his foot and mashed it to a pulp. The doctors put the cast on too tight and he got gangrene and lost his toes. The infection produced clots that clogged his heart. He was classified permanently disabled, and the state of Idaho paid him off with three thousand dollars cash, or about six months' wages.

Then my mother announced she would leave if he ever set foot in the woods again. She couldn't stand another of those unexpected phone calls. He'd been threatened by expulsion once before, in the thirties, when the bosses heard him talking Wobbly talk. But mother's ultimatum was more serious, and in the end it beat him. Marx he could do without, but not her. He was forty-eight, a broke-down lumberjack with a club foot and scar tissue on his heart in more ways than one. He never worked steady again, and it made him mean.

Off and on the old man tried. He was fired from a job as concrete inspector because he kept finding cracks. His saw filing business, conducted from our garage, failed because he insisted on straightening and setting every tooth to suit himself, and the jack-leg carpenters couldn't wait. During my last years in high school he just shot pool. He was third best in town, but couldn't make much money at it or get better, because he had years ago chopped off the index finger of his left hand, the one that guides the cuestick. In the face of so many frustrations, he got meaner and meaner. He and I finally quit talking, except for pass the salt.

This tough time coincided with a period when I read a lot of books, and discovered many things wrong with my parents. The lectures now sounded to me like pettifogging rant, with an irritating underwhine of defeat. The last couple of things I learned from him – how to fall a tree properly and file and set a crosscut saw – were, as far as he was concerned, only the rudiments of an apprentice's knowledge; but to a person going to college, where he would probably have to confront French and Relativity, a lot of windy stories about tall trees and bears were decidedly irrelevant.

I felt misunderstood in Idaho anyway. I spent one last summer up North, pulling green chain and dry-piling two-by-twelves, before I took off to get my dose of Camus and Einstein. The other millhands, kneading their leather pitch-aprons like a bunch of nosey hausfraus, had knicknamed me perfesser, and kept urging me to get plenty of campus pussy for them. During my last week, they showed their respect by letting me pick edgings for five cents an hour more. To pick edgings, one stands right beside the howling bandsaw and eats sawdust by the shovelfull. I piled the back of my 1941 Plymouth with books and cashmere sweaters and headed for Seattle (home of the original skidrow), hoping never to see another plank.

THERE WAS ONE WAY the old man could still get into the woods. For years he had been going into the Deadwood River country when the snow was off the pass in order to do the assessment work on our mining claims. There wasn't much but galena float and a few zircons in the stream bed, but the laws are such in National Forests that you can prove up a claim with one sample and maintain it by doing one hundred dollars worth of improvements every year. So in August Waldo would go up and dynamite a few potholes in the soft ground, blaze a few trees, and check the corner "stakes" (empty Olympia cans nailed to a jackpine with the location notice inside).

That country is too high and steep for anything but mosquitoes and elk, so we really weren't landgrabbers; we were only keeping up a little family tradition. My grandfather, old Will, had staked one of the first claims along the river back in 1903, at the end of the Roosevelt boom (v. Zane Grey's **Thunder Mountain**), and the assessment work was a way to keep connected to see some tall tales about those days. However, the old man was getting too crippled up to hop the creeks and clear trail. He had to reconcile himself to his citified son with a sissy job, if he hoped to keep certain lecture topics active. In the ten years between boy- and manhood, I had become a genuine perfesser, a newlywed PhD who could conjugate the irregular verbs. The summer before my first job, I got a powerful urge to toss the books aside and get back to the wilderness. It was the occasion for a *rapprochement*, a rare opportunity to collaborate. So I met the old man halfway, and we agreed that I would take over the annual assessment work, in exchange for a strict limitation of his commentary on my procedures.

Anyway, I had some brand-new bright ideas of my own. I decided I would build a sluice box, run bigger ore samples, erect a small cabin, and thus convince the BLM I was an honest-to-God miner. Then I would patent the claim – a complicated legal move that established title to the land. (That way I wouldn't have to do the hundred dollars' worth of work each year.) So I rushed out and bought a 1956 Chevrolet 4-speed wagon, borrowed the family tent and sheep-herder stove, dug out my junior mineral kit (hammer, acids, blowpipe), loaded up the old man's saw, axe, adze, singlejack, pick and shovel, and we lit out for the mountains.

The Deadwood River originates in a rocky draw between a couple of 10,000 foot peaks. Both sides of the draw are strewn with fragments of galena, an ore containing lead and silver. The main vein wasn't opened until 1910 (Old Will missed it, as he missed most everything else), and for a while the ore went out on mules to the smelter at Idaho City. But when the world craved bullets for the Big War, the Bunker Hill and Sullivan Mining Company moved in to tunnel a mile into the mountain. They also built roads, a sawmill, a string of cabins, a power plant, a smelter and a fancy lodge, all smack in the midst of the granite crags and stunted pines. Then, after the war fizzled out and the price of silver collapsed, the place was abandoned. The buckets and cables rusted away; the shaft filled up with water; snow crushed some cabins. Sometime in the forties, an old bush pilot bought

what was left, swept the rats out of the habitable buildings, hired a packer, and opened a shirttail resort for fishermen and hunters.

Weber had lost his license for stacking up too many planes, and he couldn't fly a resort too trimly either. He dreamt all the time of installing swimming pools, steam baths, and trout farms, to tap an inexhaustible supply of rich Californians. But it was all he and his wife could do to supply beer and gas and a few horses. Whenever they could, they traded junk from the mine to save cash. Over a bottle, my old man told Weber how worthless the mine was, how full of shit Californians were, and how hatchery trout couldn't live in streams over 7,000 feet. That made the old pilot mad. He shouted, on the excuse his many crashes had made him hard of hearing. Dad shouted back, just to keep even. The argument went on for ten years, during which period our family took possession of one of the dilapidated cabins, in exchange for cutting stove wood.

That was our base of operations, but it wasn't good enough for me and my new wife. We had copies of **Sunset Magazine** out of which we picked stone walls and fireplace designs and hardwood furniture sets. They would go into a darling little place we expected to build of native logs on the banks of Grouse Creek on the far side of our claim. When we had everything properly imagined, we ran the panel wagon over Whiskey Bridge to a cow camp and came to a very rude halt. The cattle outfits had given up on the road fifteen years ago, and it was choked with brush, boulders from snowslides, and big windfalls. Little daunted, in our enthusiasm and ignorance, we unpacked the crosscut and buckled down to clear away down timber. At the end of a week, having advanced about 300 yards, we abandoned the notion of motor transport. We were still nearly a mile from the site picked for our little mountain retreat.

We set up the tent by the nearest spring and walked the rest of the way on a deer trail. The meadows along the river were thigh-deep in wild timothy, and splashed with lupine and paintbrush, sego and larkspur and yarrow, and the water, when it broke out of the willows in a big bend, was so clear you could see schools of whitefish snooping on the bottom. It was the perfect place all right, beautiful and isolated. But it had two drawbacks. The mosquitoes came off the river in dense swarms, and they were that hardy kind that can breed in snowbanks and sink a shaft right through a levi jacket. We were going through a bottle of 6-12 daily. Even more crucial, it was dawning on us that every tool, every nail, every board, every shingle had to be freighted in on our backs. After a whole day spent packing the tools alone, we huddled over a pan of corn bread and boiled coffee, tuckered out and plumb discouraged. We needed help, it was now clear, if we ever expected to get one log on top of another, and forget the stone fireplace.

The packer at the old mine, an ex-rodeo hand with the glorious name of Sterling Alley, gave us the solution. "Shit," he said. "Give me a twenty dollar bill and I'll hitch up my team and haul your rig in there. Make it a pair and you can have the mare to skid your logs with." He knew his business. Stopping to cut out a small tree occasionally, he snaked a team and wagon all the way into our site. We unloaded pipe for the sluice, boxes of spikes and bolts, lumber for jambs, risers and roofing, asphalt shingles and storage barrels. I went back out with the packer and we harnessed the mare – a steeldust roan named Kate, half Morgan and half Appaloosa – with a singletree and logchain. I rode her in and we went to work. We dropped straight lodgepoles, ten inches at the butt, bucked them into twelve and fourteen foot logs, and that mare skidded them three and four at a time. Kate could stand on a dime, or back and go in six inch increments. I would set the chain, cluck once, and – *Whap!* – she took up the slack. A half-ton of wood went tearing along, over boulders and brush, never stopping unless I spoke or the mountain intervened.

I'd used a horse to pack deer and elk, and I knew they were strong, but I could see now that such work was for them very light duty. I'd also driven medium-sized Ford, Case, and John Deere tractors, and always assumed farmers quit using draft animals because they could pack fifty of them into four little cylinders. It's not that simple. I was tackling things with that horse I couldn't imagine doing with a tractor. Power for both is a function of traction and terrain, and that horse had a number of useful advantages: she could move sideways and jump over logs, and in tight places she could right her own balance. When the load hung up, she stopped without a signal.

Anyway, the term "horsepower" is a fallacious metaphor. The definition, since Watt's day, has been the power to lift 550 pounds one foot per second. But engineers have never been too happy with the notion (the **Electrician** for September, 1891, calls it "a new and shockingly unscientific unit") and stockmen can be downright contemptuous. Maybe the horses in those early days were slow or lazy, or maybe the qualities of agility and skill that a good draft animal possesses are not measurable in foot pounds, but I was dead certain that no tractor, whatever its horsepower, could do the job Kate was doing.

In four days we had all the logs skidded, peeled and notched. Kate rolled them up two sapling props with a rope, to make the walls. In a week's time I sat on the roof peak, high enough for the breeze, away from the mosquitoes, and knew whom to thank. Kate made one hell of an impression on me, though I never saw her again, and the cabin never did get much further than a shell. No fireplace, and no hardwood. A child, a couple of books, and a marital bustup got in the way. But Kate did her part. I've been

back since and the logs are still there, stacked tight, after thirteen winters of eight-foot snowfall.

I remember thinking at some point that what we were doing seemed efficient and uncomplicated and clean; I wondered why a forest couldn't be logged that way still. We hadn't uprooted a single sapling, and except for knocking a little bark off the trees along the skid trails, there was nothing to mark our presence but a few piles of slash. It was hard work, but there was a lot of fun in it, too. Kate and I got used to each other, like familiar lovers. We eased off in sync, and leaned into the job with a ferocious delight when we got going. At night, while she cropped under the trees and we sat around the embers over a last cup of coffee, we felt like a pioneer family. There was something behind the feeling, too. My wife and I conceived our lovely daughter on one of those happy, bone-tired evenings, when Kate stomped and whickered just outside the tent wall.

THIS WAS ALL BEFORE people believed in thinking small, voluntary simplicity, zero growth, organic highs, and running the mix-masters on chicken manure. In the old days, everybody thought in terms of a second home in the country (with a stone fireplace) and a good job to pay for it. Some people still think that way. In the inaugural issue of **Outside**, Tom McGuane mentions rolling out of bed, way out in the Missouri brakes, ready to face the morning chores. The chief chore turns out to be working on another screenplay so the bank won't take back his ranch. It's an understandable approach. One of the difficulties of the simple life is making it pay for itself. Most of us find out that raising a few acres of hay or selling peaches on the roadside won't do the trick, if there is a mortgage to be knocked back. To get by, we have to pump gas or sweep floors or teach school back in the bad old town. Lucky, indeed, are those with a portable and lucrative job like screenwriting.

We all know you can't take up space on the planet without buying somebody off. Property taxes, bridge tolls, parking meters, camping permits, toilet stall locks . . . You can't stay here free, buddy; this is Earth. Money is quite as necessary a nutrient, oh ecopersons, as air and water. It protects us from imprisonment and forced labor. But to earn a decent minimum, and stay pure according to the new Sierra code, is a tricky maneuver. Most of us have to make some embarrassing deal with the Satanic mills.

There are deals, and deals, of course. I think what we need right now are some inspirational examples. Not helpful hints on growing your own parsnips, not blueprints for a condominium built of compacted garbage, but some true-life stories of people who make a decent wage without adding to the clutter.

This summer, I happened to be visiting the boss lady of a ranch on the Big Hole in Montana. Her main business is harboring Sandhill Cranes and restoring old sheep wagons. Some of her friends from Oregon showed up for a visit: a blonde lady who stitched teepees to make her way, and an angular man in spectacles who said he was a horse logger. We fired up the sauna and, as strangers will, sat around in the heat and dim light and drifted lightly over a number of topics. We discussed why schools don't work anymore (Tom Harpole, the logger, said he quit after he turned in a term paper copied verbatim from the assigned text – stopping in the middle of a sentence when he reached the word limit – and the professor gave him a B anyway); why people have given up acid for juice (we concluded that there is no percentage in developing a high tolerance for small miracles); why relationships unravel so quickly nowadays (a lot of edgy banter on the women's movement here; one memorable jibe: "take back their shoes and library cards"); why, in fact, not much works anymore but work itself. We were all, it seemed, pretty involved in what we did, and all searching for that honorable compromise, earning the natural buck.

Tom began talking about working in the woods, and what he said reminded me of my old man's lectures, only without garrulity, bitterness, or yearning. The more he talked, the more I was sure the pain of my father's life could have been avoided, if back then somebody had come along with the idea of logging small. But back then the nation thought big. I had proof in the family album. Big companies, big cats, big trucks, big logs, big saws, big checks. Common people hoped to work overtime, make a pile, move to town, and eat store-bought white bread under electric lights. Even so, the old man used to grumble about waste and ruin. Most companies didn't cut to suit him: they took too much, and wouldn't harvest broken or diseased trees. He would have loved the idea of going back to horses to beat the big outfits.

Later in the day, when we were walking around looking for mushrooms, I noticed something familiar in the way Tom moved through the stand of timber. I remembered, as a child, thinking that all the men in the logging camps, except the cook, looked a little ape-like. (The thought may have been suggested by Waldo's use of the epithet; any man he didn't know was referred to as "that ape.") Loggers do tend to be skinny and hard and ready to jump. When a big yellow pine goes down, slow at first, and then with a loud sigh whamming into the earth, they swim all over it, axes flashing, while needles and bits of bark are still flying. They light in a crouch, the spikes on their boots digging into the rough hide. Pitch blackens their clothes, hands, and faces. Sharp as turpentine, the fume of fresh pine flares their nostrils. They climb horizontally, monkey-quick, tight with the tree. When they jump down and walk on the ground, they stride with heads tilted up, arms swinging free and hooking out a little. What is running through their minds, I think, is just how to fall the next one. Like the sea and horses, sawdust gets in the blood and affects the posture.

We didn't get into all that right away. After the sweat we passed the jug and the joint and picked a little banjo. I asked how he got into the business. They weren't the first, Harpole said. There were already several outfits in Oregon doing contract logging with horses. For Tom and his cousin Jerry (real names, readers), the main attraction was making clean money outdoors. They hadn't yet discovered that they loved to cut timber. They heard about the other horse outfits, and decided to investigate. They hadn't much experience, though Tom had done some amateur rodeoing, mostly bull-riding, and knew he could handle stock. The market, they found, was already developed. A good deal of Oregon's economy is based on the timber industry, and there are sawmills of all sizes throughout the state. The problem is that the populace wrangles continually over the issues of employment and spoliation. The Harpoles were attracted by the notion of tying into the state's chief industry in a way that foiled the demon technology, and put some fertilizer into the woods.

They bought the most essential items first: they paid $600 for a Percheron stud, "Carbon" (sometimes less affectionately known, Tom said, as You Black Sonofabitch), and $150 for a used Homelite saw with a two-foot chain bar. They already owned an old truck, and stacked it with the necessary accessories: peevees, canthooks, gas cans, harness parts, hard hats, feed bags, and the like. The total investment at the outset, Tom figures, was around $1,000. Later as times got good, they added Buck, a 2,200-pound Belgian gelding to the crew. But the whole stock of gear, down to spare gloves and socks, cost less than the motor of one diesel cat.

Their first job was a perfect introduction to the possibilities of the business. They were hired by Paul Goodmanson, the former Dean of the School of Forestry at Oregon State University, to thin a thousand-acre tract of timberland. Tom says it was like being paid to go to graduate school. Goodmanson took them on a cruise (walking over a patch of forest to assess its yield is known as "cruising timber") and explained the principles of right harvesting. He told them that even small stands of timber need thinning; that many farmers and ranchers own swatches of trees on back pastures and hillsides that could be selectively

Horses are more intelligent, nimbler, and less destructive than a caterpillar tractor at snaking a log through the woods. A horse is also better company – ignores your shouting with closer attention. You don't want either one to roll on you.

cut (though big logging outfits consider such jobs too small to pay).

Thinning, the professor said, was ecologically perfectly sound. When trees grow too thickly, many remain stunted. They choke out grasses and other fodder. Some trees have conk-fungus, or are insect-infested or sun-scalded. Some are "cat's faces" – trees once marred and later stricken with heart rot. Some are "schoolmarms," trees broken once and growing afterward into two trunks on one stump. Whenever there is enough wood to make a stick (log) such trees should be harvested, since they are potential windfalls, and can damage other trees or knock down buildings or fences.

Goodmanson told Tom and Jerry that he recommended thinning every five or six years in a stand of a few hundred acres, and that this schedule should produce, without diminishing the forest, around 10,000 board feet per harvest. Even grade two or three lumber is worth better than $200 a thousand (loggers mark timber as "thousands" of board feet; that is, a thousand feet of plank twelve inches by one inch), so a harvest yields a minimum of $2,000, and often twice that. Big trees with no knots yield "peeler" or veneer grade lumber, worth a dollar a board foot, which increases these figures dramatically in a very good stand.

The Harpoles learned also about leaving "grouse ladders" (thick, bushy trees) to act as windbreaks at the edges of timber stands, about judging soil types by measuring the "leader" (the last finger of trunk jabbing skyward in evergreen forests), and about making efficient skid roads and landings. When they began to cut and move the logs, working at first with one horse, they discovered that the trickiest and most important step in successful cutting was "falling a lead." To fall a lead, the logger must pick out the optimal site for a landing, and then drop each tree near a skid trail, its top pointing toward the landing. Otherwise he spends too much time thrashing around in the brush trying to jack a log into position, and skins or breaks young trees. Mechanized logging companies, of course, need not work so precisely; they smash down every obstacle with a D-8 cat.

"If you expect to be invited back," Harpole said, "you have to leave the site clean. That means more than low stumps. We never left anything more than a foot high. It was compost, not slash." There are, he explained, straight business reasons for tidiness. "It makes it a whole lot easier to do the second time around. And – the main thing – your whole rep as a horse logger is based on how clean you do the job. Those trees are the farmer's own back yard."

Photo by the famed Darius Kinsey of horse logging in the Pacific Northwest during the first decades of this century.

The Harpoles did neat work, and the jobs came one after another, until they were turning them down. Generally they contacted farmers or ranchers with small patches of timber. They cruised the stand, gave an estimate, and struck a 60/40 deal, lion's share to the owner. If the rancher had a small cat with a blade, they would borrow it to cut one main skid road and landing. The timber was sold mostly to local sawmills, who sent out self-loading trucks to haul the logs from the landing, and there is an agency, maintained by the state, that scales each load (figures its board footage) at ramps provided on all roads where timber is hauled.

Later, the Harpoles caught on to bidding for the harvest of small tracts of government forest. The Bureau of Land Management and the state Forestry Department will, upon request, send notices of all timber sales, giving the location and size of the stand, and average diameter of the trees. Any firm can cruise the site and submit a bid (traditionally, one-third of the whole cost), and the Harpole's company "Horse Drawn Forest Products," found it could compete successfully with the mechanized outfits on small lots.

It isn't even necessary to back up the bid with hard cash. There are bonding agencies that will guarantee payment of the first third for a fee of around $100 a year. The second third is payable during the cutting, and the last third when the last log is delivered.

One sauna wasn't nearly enough to cover these matters, and I was curious also about the tackle of the trade, and how it was, working with horses. Tom invited us to continue the discussion, in a week or two, at his new place. He had taken over his grandfather's old placer claim, a hundred acres or so of sidehill somewhere below Missoula. Since the boost in the price of gold, he was interested in finding out whether the old sluice box method could be revived, and another honorable deal struck between Man and Environment. Eastward, ho.

Ten days later it turned rainy and the trout in the Big Hole stopped hitting flies. I stuck the banjo in the Volvo, picked up a fifth of Early Times at Swede's in Wise River, and headed North. Around Butte, the terrain shifts suddenly. On the western edge of Montana, the snaggle-tooth granite of the Divide pokes above sweeps of dense lodgepole and big, open hay-meadows, strewn with the black boulders of Angus cattle. Then, only a few miles to the East and North, you run into antelope country, ridges of sagebrush under an immense sky, where cloud-schooners boom along under full sail.

The Harpole claim turned out to be on the interface. The jackpine and sagebrush had about equal footing. There were blocks of hayland in the valley below his hillside, and some crags above that still held a few flecks of snow. Tom had been remodelling, tearing lathe and plaster out of the old house, but he was taking a forced rest when I arrived. The day before he had noticed the dog sniffing around the trapdoor to the root cellar, and, hearing a bump in the night, he took a flashlight and started down the narrow, steep stairway. Midway, he collected a seatfull of quills from a porcupine hiding between two steps. He was still too sore to sit, so we undertook the completion of the interview horizontally in the front yard, the Early Times and a pound of fresh cherries between us.

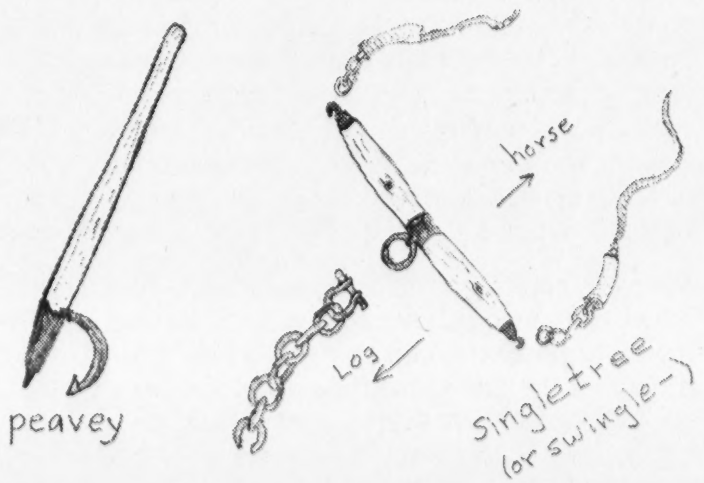
We went back into the economics first. My native American greed still needed reassurance that technological regression could pay off. I asked for a straight income and expense breakdown of the operation. On good days, Harpole said, one man can put 150 saw logs a day on the ground (a saw log is a trimmed section of trunk ready for the mill). That many logs,

even if quite small, will run around 8,000 board feet. A skidder with one horse, however, can move only about half that amount, so periodically the faller shifts to skidding with a second horse. The Harpole's team of two men and two horses managed to get about 100 logs a day to the landing, a minimum of 5,000 board feet. At the low grade price of $220 a thousand, they would clear $440 for themselves, $660 for the owner of the stand. With an occasional peeler log, Tom figures he and Jerry were hitting $500 a day, split down the middle.

The expenses were mostly fodder for the horses and gas for the saw and truck. They fed Buck and Carbon seven pounds of oat/corn/molasses mix twice daily, with a sidedish of a bale and a half of hay. A per diem of $12-$15. Another $10 went for gas and oil and an occasional tire patch. With $25 set aside for a repair fund – welding broken singletrees, shoeing the horses, or putting a new clutch in the truck – they were still averaging $150 a day apiece. "But," Tom granted, "every couple of weeks we'd give out and go on a little bender and lose a couple of days. But when we were working right, us and the horses hitting together, we made $2,500 a month." A sum, it occurred to me, close to what Idaho had given my old man to last him the rest of his life.

To get a grasp of the amounts of timber and money involved, in comparison to conventional logging, I asked for yearly totals. Tom estimates that Horse Drawn Products cut three-quarters of a million board feet in one year, with a net profit of about $60,000. A big timber company cuts a million board feet a week. However, such companies have long-term high overhead and fixed costs. The advantage of horse logging, in pure economic terms, is that a layoff costs the investors only a little hay. If payments must be made on cats, trucks and loaders, on the other hand, a company has to keep cutting or go broke.

Most of the equipment a horse logger uses is relatively cheap and easily repaired. I had Tom run over the list of parts and patching tools. Besides the saw, truck, peaveys, and hardhats, the company's stock included a fifty-foot steel measuring tape (about $10), caulked boots ($50 a pair), heavy duty harness ($200, but good for a lifetime), chain tugs with leather sleeves and a twelve-foot log chain (about $25), a handmade singletree of two-inch pipe triangulated with rebar (necessary because wooden singletrees snap in underbrush), a coldshut and clevis pin to mend the chain, a clasp knife with leather awl, and a pocket full of baling wire. "Can't stress enough," Tom added, "the importance of that last one. You can hang the whole outfit together with that damned wire and a few scraps of leather." An optional but very useful item is a pair of sonic ear valves, available in powder and heavy equipment stores. These plugs have variable baffles that screen out noise in direct proportion to its decibel level. They allow one to run a chain saw comfortably, and listen to the offended bluejays between logs.



We had the statistics down, finally. I suggested after a while that we move on to the more romantic and subjective aspects of the woodsman's life, his feelings for nature, animals and so forth. This shift effectively chilled the discussion, until I backwound to get a better understanding of the function of the baling wire, and asked about situations requiring repairs.

Most ripped harness or broken chain will result from a misunderstanding between man and beast, Harpole said. One or both in the team gets tired and misses a cue. A good horse will stand while the singletree is hooked up and the chain thrown around the log. The skidder then slaps the seventeen-foot driving lines, or hollers, and the horse leans into the harness, hitting hard at the outset to overcome the inertia of the load. A sensible and properly trained draft animal does not spook at an unusual rattle of chain or branch. Some skidding horses, in fact, know the trade so well they will take a load of logs by themselves to a familiar landing.

Tom recommended caution with such experiments. Once, he said, Buck got a peculiar notion to travel while he was strapped to a little log, two feet thick at the butt. He ran six miles before he got fouled in a fence and couldn't budge. "It was embarrassing. He ran right through a gang of sawyers from some big outfit working on another tract. A half hour later they got a good laugh at these two hippy loggers, all out of wind from running five miles after one pecker pole." If a horse bolts, he added, it is necessary to drive him and the load all the way back. Otherwise, the animal concludes that such creative side trips earn him a couple of hours off duty.

Most of the time, Tom found horses to be more sensitive and alert to hazard than their drivers. His experience confirmed my memories of Kate: working with another intelligent being is safer and more gratifying than operating a machine. When a good horse gets in a tight place, he has sense enough to stop and let the driver untangle the mess. He can also detect malfunctions in equipment and respond by balking. And there is a certain rhythm, a surging together, that makes the work a joy. "A couple of times I remember," Tom said, "when everything was clicking. We took out better than eighty sticks a day, without one hangup. That horse gave me everything he had, and I couldn't do less. It wasn't work at all. It was a kick."

We were down to the last inch of Early Times, so I tried again to press on and develop this romantic aspect of the job, but I guess I don't have Charles

Kuralt's gift of sliding into that kind of thing. The closest we got was shouting back and forth about how much we knew a horse could move. I estimated that Kate skidded a clean 700 pounds a shot all day long. Tom claimed that he had Carbon, at the end of a ten-hour shift, boosting a half-ton two hundred yards up a ten percent grade. I expressed reservations. Tom shook his head. "He did it all day long. On the last log, when I saw that stud lift his front feet and hit that harness – sonfabitch brought tears to my eyes." I kept quiet. I was still dubious about the half-ton figure, but I respected his reverence. Kate's memory was safe, anyway.

There didn't seem to be anywhere further to go with the interview. The pain of the porcupine quills had been pretty successfully medicated, and we had finished the cherries, so we headed into town for some Tombstone pizza. Tombstone pizza, as far as I know, exists only in rural Montana bars, where it is a tremendous advance over beer nuts and jerky. The name even turns out to be ironic, as the stuff isn't bad, washed down with a few cans of Fairy Piss (the local name for Coors). After a medium sausage and mushroom combo and a couple of FPs, we shot pool for an hour. I tried, without much success, to remember what the old man had told me about english and follow-through. At some point, we got into a very abstruse discussion about time, machines, value, and so on.

"It's like this," Tom said, "or I think it is anyway. I used to leave my saw in the woods overnight and come back to find these little speckles of rust on the bar and a couple of mushrooms pushing up through the handle. And I'd look around at all those big old quiet trees and think: 'This is the seventieth climax growth of fir in the Pacific Northwest.' So what the hell difference does it make? Come and Go. One second, one billion years. Right?"

"Right," I agreed. But I was losing my grip on specifics. "But what else was there? Between the fir climaxes I mean. When the aborigines – "

"Oak."

"Aw horseshit."

"Hell there wasn't. Oak. Oak all the way to Canada. Known fact. . . ."

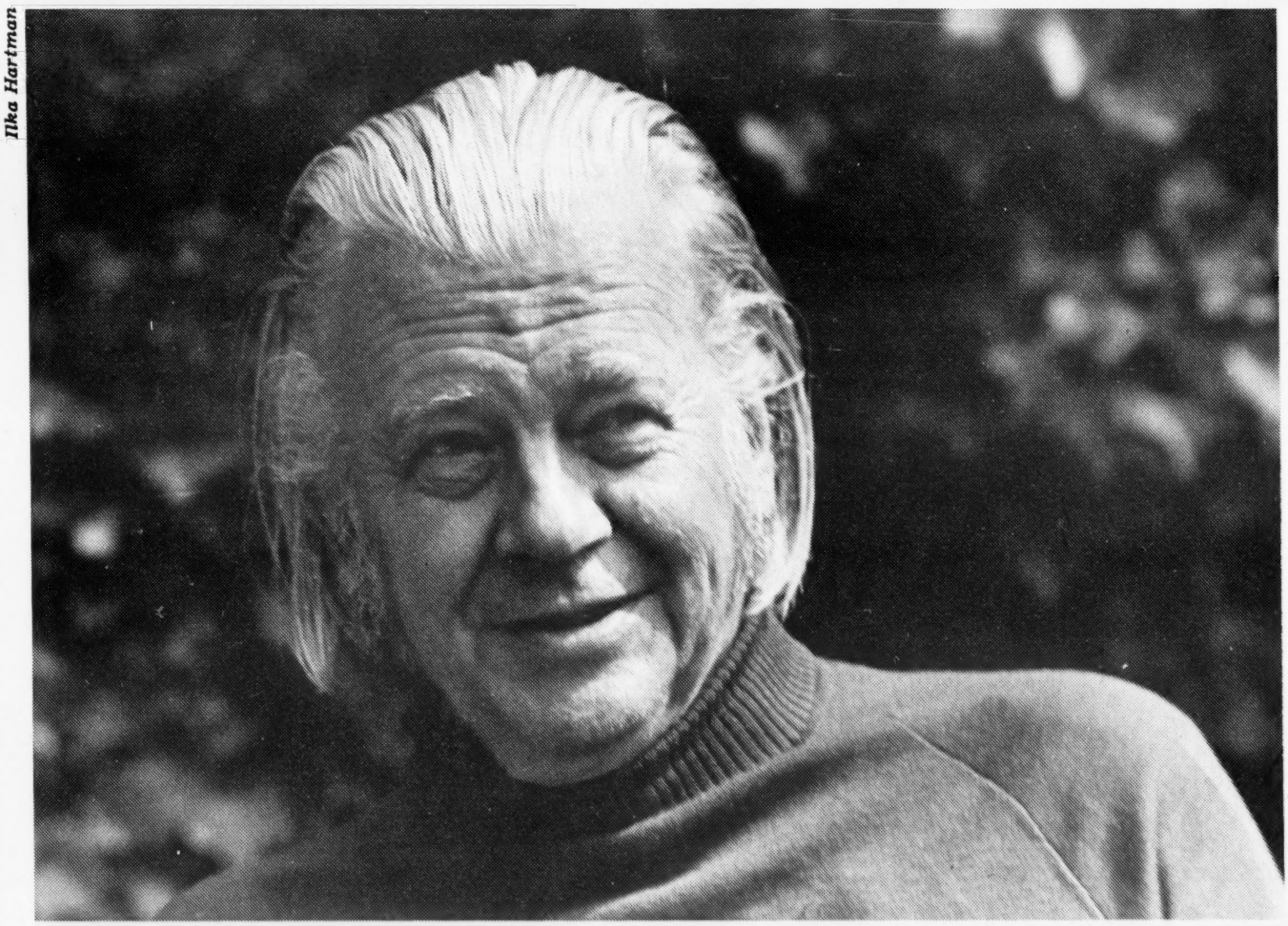
I ordered another round, gearing up for the lecture. ■

"Plant a Tree for England"

BY E.F. SCHUMACHER

ABOUT twelve years ago I received, quite unexpectedly, a letter from the United States. I looked at the name, and it said, Richard B. Gregg. I said, "It can't be Richard B. Gregg," the friend of Gandhi's whom I never met. It was him. It simply said, "Dear Mr. Schumacher, I have read one or two of your articles, I like what you are doing. Gandhi used to say, 'When you are very old, walk through your library, pick out the books that you consider the most valuable and send them to a younger man.' And that is what I've done, so you will be receiving a parcel of books."

Well, this parcel of books arrived, and I opened it, and there were the most excellent books, which I would never have found. Among them was a book called **Tree Crops**, by Russell Smith, published in 1929. It said, "Tree Crops – a system of permanent agriculture." That seemed to me to be a bit far-fetched. I think that was the last book I read out of that parcel, but I did read it, and it was one of the most interesting and fascinating and challenging books I've ever read. But circumstances weren't favorable, I couldn't do anything about it, it's always very

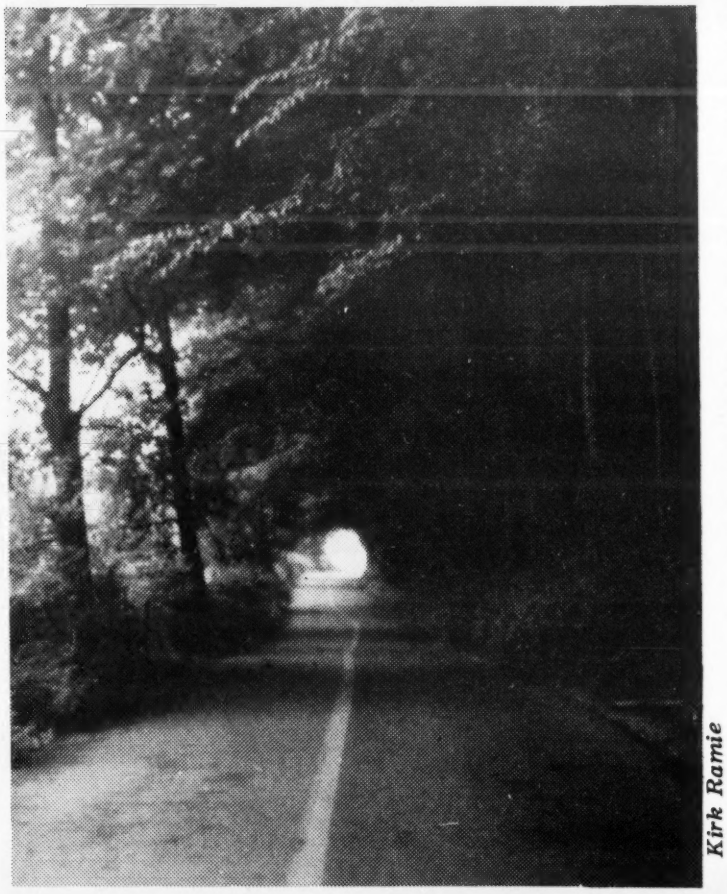


Ilka Hartman

About five months before he died in the Fall of 1977, E.F. Schumacher, the author of **Small Is Beautiful**, *was at the San Francisco Zen Center's Green Gulch Farm on the occasion of a tree-planting ceremony. His brief remarks revealed a whole body of enthusiasm, experience, and ideas about trees not widely known to be part of his appropriate technology program.*

–SB

dangerous to have knowledge and not use it, not make something of it, it starts festering in you.


Kirk Ramie

But it became known to some people that I was very much interested in this whole subject of food-producing trees, and I got a letter from a man called Sholto Douglas, who is a kind of successor to Russell Smith, saying that he had written a book on forest farming* and asking whether I would write the preface for his book. I said, "Yes, I will write the preface, but I can't now read a second book on the subject and not do anything about it. I have some wasteland, overgrown with thorn bushes just above my house, which has never been touched by human cultivation. I will get two acres cleared, and you will have to tell me what to plant."

And all this actually happened. I was lucky enough that Peter Gillingham was staying with us when the time came to dig the holes, and so I got him to lose some weight, and the trees have been planted. The advice of Sholto Douglas (who is now the tree expert, particularly on food-producing trees) was quite humdrum – hazelnut (to be grown as a tree, not as a bush), walnut, honey locust, mulberry, and chinese chestnut, arranged in circles of the five trees, covering these two acres. An ounce of practice is perhaps sometimes even more rewarding than a ton of theory. I don't fancy I shall be sitting under the shade of enormous trees, but my son will.

Being interested in trees I looked particularly in the Third World for trees. I wrote in India that Indians could do a sort of popular movement with tree planting. Government can't do it, bureaucracy can't do it. The tree is a living thing, it's got to be looked after. It ought to be an I-Thou relationship between the person and the tree. If they could get a popular movement to plant trees, and if for instance they would make a special effort for five years running, every able-bodied person in India, children, grandfathers, grandmothers, everybody, plant one tree a year, and see to its establishment, the economic value for India would be very considerably greater than any of their five-year development plans had ever promised. The planning commission didn't like this, but I kept hammering, and now, for whatever it may mean, the crown prince there, San Jay, Mrs. Gandhi's son, whom she's grooming as the third member of the dynasty, has issued this slogan in his electioneering campaign, "Let everybody plant a tree." I hear he's also making some arrangements so that you can get seedlings.

I will let you into a secret. Owing to the good sales of my little book, I am now in great danger of supplying our Minister of Finance with too much money, which they will then spend on nonsensical things, and so I have lopped a major part off to establish a tree fund. I can do this through the Soil Association, of which I am president. The scheme is to start with all members of the Soil Association. They will each undertake to plant a tree. We have a bit of land. Out of this tree fund they will get the seedling free of charge, and they will sign a kind of gentleman's agreement, which of course is not meant to be enforceable, to abide by certain rules. The idea is to get as much stock of food-producing trees established as possible. The selection work, the genetic work, still has to be done, but why wait till it's been done? The establishment of the stock takes times. And anyone who's ever practiced the noble art of grafting knows what a wonderful thing it is.

I can see the day when the finest and best specimen of honey locust is discovered somewhere, and from the one tree we can graft this quality onto stock, ad lib, almost as many as you like. I know someone who knows everything about grafting, but when I first started practicing bud grafting, I felt I really encountered one of the miracles of nature. That tiny little bud is a chemical factory. In the back streets of London you'll find old Londoners who have one apple tree and they have grated onto it twelve different kinds of apples, so nearly all year round they have some kind of apple – a cooking apple, an eating apple – all from the same stock.

So that is the great tree scheme. Britain will have to learn to feed herself. I can't see that this can be done easily, certainly not by modern agriculture. It may be possible to do it by getting very much smaller holdings, and bringing the human factor back into agriculture, but the best bet, I'm sure, is trees, which can grow in hilly and rocky country, where when

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*The books are **Tree Crops** (A Permanent Agriculture), J. Russell Smith, 1950, 408 pp., $6.95 from The Devin-Adair Co., 1 Park Avenue, Old Greenwich, CT 06870, and **Forest Farming**, J. Sholto Douglas and Robert A. de J. Hart, 1976, 196 pp., $8.95 from Rodale Press, 33 East Minor, Emmaus, PA 18049. Both books are available at these prices from the Whole Earth Truck Store, 300 Page St., San Francisco, CA 94102.

agriculture tries to climb up the hills, you get erosion problems, produces a sort of two-story agriculture, with the fruit of the trees and livestock grazing underneath the trees. The difference of productivity is really breathtaking. Russell Smith and Sholto Douglas claim that the carob tree or the honey locust will produce protein food at the rate of twenty tons an acre, when two tons an acre of wheat is something you can be quite proud of. It's a different order of magnitude altogether. To know that and not to do anything about it seemed to me to be quite intolerable.

It's an interesting thing because tree planting is a very non-violent technology, and a very democratic one. I think we shall have to learn more and more to look out for and develop non-violent democratic technologies. By democratic I mean you don't have to have studied for years and years, you can do it yourself, you don't have to be rich, you don't have to have great equipment. It's something everybody can do, and something with which he can or she can enrich the country and for once do something for future generations and not only for themselves. I believe that this appeal, "Plant a Tree for England," coupled with the assurance, "It won't cost you anything," – (The moment it costs you anything idealism goes out the window) – and with the assurance, "You probably won't profit for it, you're doing it nobly, not egotistically," I think that appeal will really hit home. Maybe in a few years' time I can come back here and report whether it's gone well or not.

My reading of the situation is that the technological development has become extremely anti-democratic. It's very difficult, in spite of so much sociology and what-have-you, for the modern mind to understand the political implications of technology. They think this is all sort of politically neutral, whereas, of course, if we develop machinery for the reaping of tomatoes which costs $120,000 apiece, then the small farmer can't compete with them, so it's a highly undemocratic, and anti-democratic, development. Everywhere one finds this fascination with bigger and more complex and more costly technology, so that the number of people who can really independently participate in the production process narrows all the time. The same people who are so uncritical of the technological development then stand up and shake their fist at the multi-national corporations and don't seem to be able to make the connection that if you have a technology where each unit costs hundreds of thousands of dollars and is so complex that only a highly trained specialist can look after it and operate it and so on and so forth, then you come to the point that only multi-national corporations can use it, and so they rule the roost. So I'm most interested in any technology, even to the humble and wonderful simple level of tree planting, which everybody can use. I start with Gandhi, I finish with Gandhi. This is also what Gandhi recommended. Every machine, every technological advance is welcome provided it is of a kind that all the people can participate in it. If it is out of the reach of the vast majority of people, avoid it. It will tear society to bits and lead to nothing good.

Quest/Snowdon/Camera Press

Another British tree enthusiast, J.R.R. Tolkien, author of **Lord of the Rings** *and* **The Silmarillion.** *He had particular fondness for his fictional tree people, the Ents.*

[As the gathering is about to turn to the tree-planting part of the occasion, Abbot Baker Roshi introduces California Indian (Yurok) Harry Roberts to explain where a couple of the trees came from.]

Baker Roshi: We have five quaking aspen from Harry Roberts. I guess these trees don't grow along the coast normally, is that right? Will you tell the story of where these quaking aspens came from?

Harry Roberts: The quaking aspens don't grow at sea-level worth a darn, and the average aspen in the Sierras is a scruffy little thing when it's down here; they don't get more than fifteen or twenty feet high, and usually the leaves all turn black due to fungus. For years I was in the nursery business, and for years, fifteen years in fact, I hunted for one of the Rocky-Mountain aspens that could accommodate to the low altitude here. I finally found one in a little canyon up at the head of Long Leaf Lake at Lake Tahoe. It's been in propagation for about 15 years now. The parent trees are in the neighborhood of 60 feet high, and have trunks that are close to 10 inches in diameter or more. It was from these trees that these cuttings were propagated. Since I used to work on this ranch before the Zen Center got it, I now have my old chicken coming home to roost again.

Baker Roshi: Harry is our year-round tree-planting expert. He has secret stock up and down the coast in nurseries that he's helped start. Every now and then just when you're thinking, "Now, what could be possible . . .?" he says, "Well, I've got these little trees that fifteen years ago I found . . ." Harry, there's going to be generations grateful to you and to Dr. Schumacher. ▪

Ask the Women

The Environmental Protection Agency asked the Oregon women, finally.
But nothing is final about it.

BY CAROL VAN STRUM

ENCLOSED IS AN EXCERPT from a prophetic poem by Benet: it's badly typed because it makes me cry to read it, but that's just my perspective, really, it's a dreadfully relevant piece, especially to the chart from Alsea, also enclosed. "And the next day the women knew . . ." Well, I don't know how closely you've been following all this, so I'll try to explain what's happening now around here, and what led up to it.

On March 1 the EPA ordered a temporary emergency ban on 2,4,5-T and 2,4,5-TP (silvex), the two phenoxy herbicides that contain the dioxin TCDD. The "temporary emergency ban" – an unprecedented move by EPA – halted the sale or use of those two chemicals, except on rice or rangeland, until "suspension hearings" to be held in April determined whether the agency would proceed with lengthy "cancellation hearings" which could take up to two years. The ban was declared because recent studies from our area had indicated that these two herbicides might be responsible for startling increases in miscarriage and spontaneous abortion rates in sprayed areas. (Inexplicably, the ban does not extend to rice and rangeland, areas of direct exposure to the food supply for the entire nation: its beef, milk and rice.) At the scheduled hearings manufacturers of the chemicals would have to present convincing proof of their safety, to be weighed against many years' evidence, both scientific and "anecdotal," of their potential harm.

The immediate response of Dow Chemical, the major manufacturer of 2,4,5-T, was to sue in Federal Court for an injunction against the ban, which was denied on grounds it was not the Court's jurisdiction to rule on the performance of a federal agency in fulfilling its mandate. Dow's next move was to withdraw from the suspension hearings three days after they had begun, along with all but one of the other plaintiffs, essentially leaving EPA in limbo. As things stand, right now, the ban is still in effect, and if no suspension hearings take place it will be effective until cancellation hearings are completed.

It's interesting – and gratifying – that EPA is finally acting in behalf of the people it is supposed to protect. When we (Citizens Against Toxic Sprays) took the Forest Service to court in 1976 to try to stop them from poisoning us, it was only after all attempts to get EPA, DEQ, or any other federal, state or county agencies to help us failed. That suit, by the way, was only temporarily successful. We could sue under NEPA only on grounds of an inadequate environmental impact statement. The Forest Service EIS (Environmental Impact Statement) was found to be inadequate, and an injunction was granted, to be in effect until an adequate EIS was submitted to the court. In March, 1978, a new EIS was passed by the judge, with expressed misgivings, and spraying resumed. Through all of our court proceedings, the EPA performed more as our adversary than our ally: their own employees testified in support of the spraying, and we were able to obtain some of their own studies only through subpoena. Someone suggested at the time that the only evidence that would wake EPA up would be a dead baby. And that, in effect, is what Bonnie Hill presented them with last year.

Bonnie teaches high school and coaches basketball in Alsea, just east of our farm. It's a small logging community on the Alsea River, which our Five Rivers runs into: timber land, like here, private, Forest Service and BLM. Bonnie lives with her family on a beautiful, remote farm that is surrounded by BLM lands. In 1975 she had a miscarriage, and two years later, reading some of the studies of effects of 2,4,5-T on monkeys, she wondered if the federal Bureau of Land Management had been spraying in her area at the time of her miscarriage. She was informed by BLM that 2,4-D and silvex had been sprayed on the surrounding lands a month before her miscarriage. She recalled hearing of former students who had miscarried during the same spring and went to talk to them. Through them she found out about other women who had miscarried in the area. Quietly, with no assistance or support from any agency or group, she embarked on her own investigation, collecting spray data from often-reluctant timber companies, the Forest Service, and BLM, and miscarriage data from the women and their doctors. She drew up a chart listing the dates of the miscarriages, the dates of herbicide applications for each agency and company, and amounts and names of the chemical compounds used by each, and noted the correlation between them. She drew maps of

Carol Van Strum, our Learning Editor who lives in the Oregon rain forest, wrote the piece on herbicides that appeared in the previous CQ. *While that issue was on its way to press the Environmental Protection Agency made a landmark decision to ban the use of a few herbicides in the Northwest, based on the experience and complaints of some citizens in Carol's neighborhood. The media popped its flashbulb and moved on. Hey, what's the inside story, we asked Carol. Not much to tell, she replied, mostly the spare-time efforts of "various nobodies, mostly women, housewifely types and most unradical, just fighting for their children's lives like cornered badgers." Tell anyway, we asked.*

–SB

He tapped some charts on a table.
"Seen what?" I said.
"Oh," he said, with that devilish, sidelong grin of his,
"Just the normal city statistics – death and birth.
You're a soldier now. You wouldn't be interested.
But the birth rate's dropping."
"Well, really, sir," I said,
"We know that it's always dropped, in every war."

"Not like this," he said. "I can show you the curve.
It looks like the side of a mountain, going down.
And faster, the last three months – yes, a good deal faster. . .
It makes a neat problem – yes?"

. . . "The stars may be tired of us. No, I'm not a mystic.
I leave that to the big scientists in bad novels.
But I never saw such a queer maternity curve. . . ."

His eyes looked tired as he stared at the careful charts.
"Suppose there are no more babies?" he said. "What then?
It's one way of solving the problem."
"But, sir – " I said.
"But, sir!" he said. "Will you tell me, please, what is life?
Why it's given why it's taken away?
Oh, I know – we make a jelly inside a test tube,
We keep a cock's heart living inside a jar.
We know a great many things, and what do we know?
We think we know what finished the dinosaurs,
But do we? Maybe they were given a chance
And then it was taken back. There are other beasts
That only kill for their food. No, I'm not a mystic,
But there's a certain pattern in nature, you know,
And we're upsetting it daily. Eat and mate
And go back to the earth after that, and that's all right.
But we're blasting and sickening earth itself.
She's been very patient with us. I wonder how long."

. . . "Well?" I said,
and my voice was a little thin. He looked hard at me.
"Oh – ask the women," he grunted. "Don't ask me.
Ask them what they think about it."

. . . And the next day the women knew.
I don't know how they knew,
But they smashed every government in the world
Like a heap of broken china, within two days. . . .

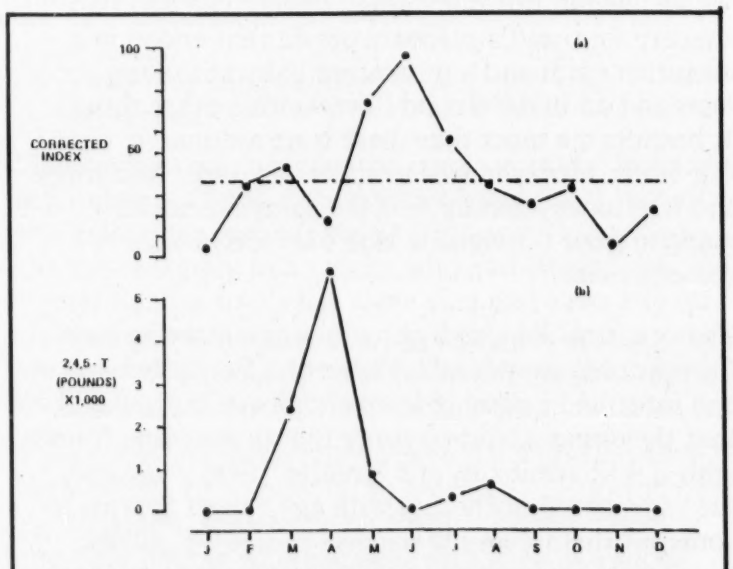
Well, we had a long run. That's something.
At first they thought
There might be a nation somewhere – a savage tribe.
But we were all in it, even the Eskimos,
And we keep the toys in the stores, and the colored books,
And people marry and plan and the rest of it,
But, you see, there aren't any children. They aren't born.

From "Nightmare for Future Reference," by Stephen Vincent Benet, 1938.

exact spray sites "based on the admittedly incomplete data that I had," and noted that each of the women lived within ½ to 2 miles of a sprayed area.

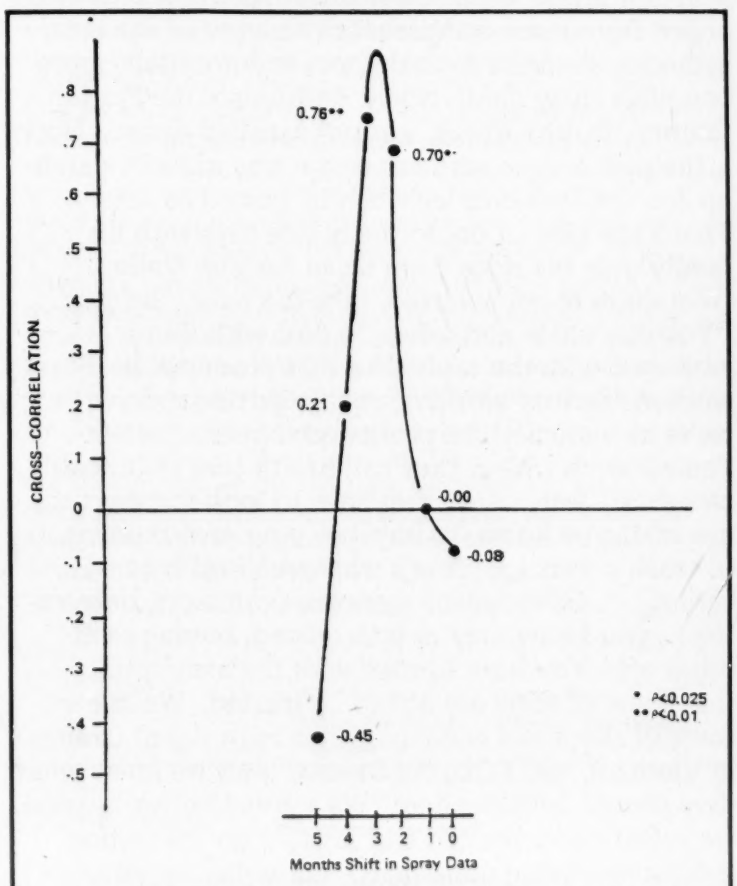
"At this point," Bonnie says, "the correlation between the dates of the sprayings and of the miscarriages, coupled with the spatial correlations of spray sites to the women's homes, seemed too strong to ignore. A cause-effect relationship was suggested, although at no time have we ever claimed that the high correlations actually proved a cause-effect relationship. We realized that more study would be necessary to reach that conclusion, and in fact doubt that such a study could ever be conclusive because it would have to be so retrospective – the most recent miscarriage in question occurred two years ago, and the earliest one in question occurred six years ago.

"Realizing that since there were undoubtedly more miscarriages that we did not know about, and that the rate, just based upon the ones that we did know about, was abnormally high, it seemed clear that more research needed to be done. . . . It was at this time



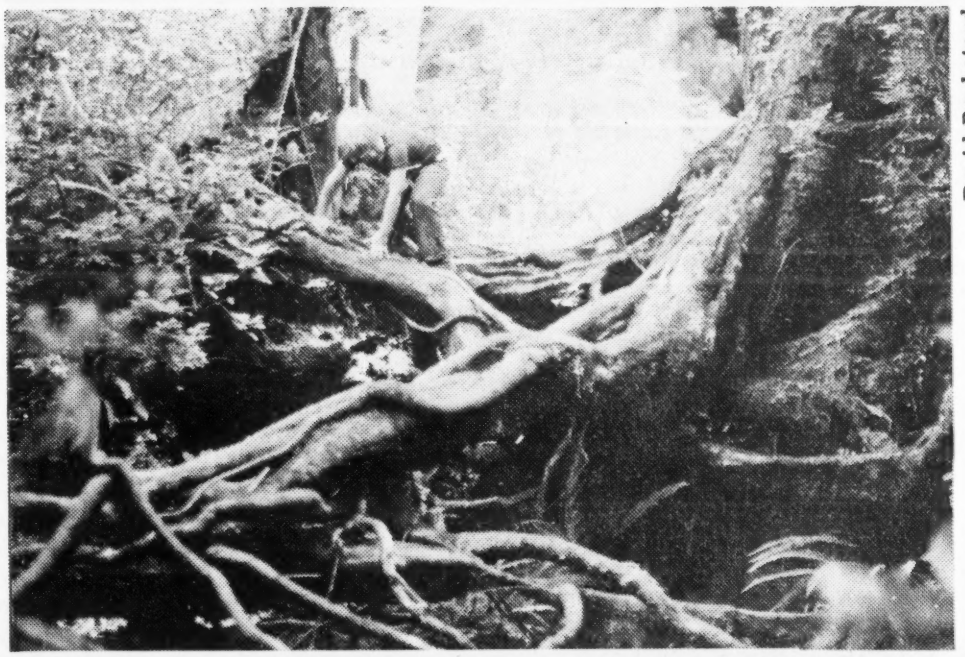
(a) Study area abortion index corrected for phase-shifted urban index; (b) pounds of 2,4,5-T sprayed by month.

From *Preliminary Report of Assessment of a Field Investigation of Six-year Spontaneous Abortion Rates in Three Oregon Areas in Relation to Forest 2,4,5-T Spray Practices."*
Prepared by Epidemiologic Studies Program, Human Effects Monitoring Branch Benefits & Field Studies Division OPP, OTS, EPA, Feb. 27, 1979.



Cross-correlation of study area abortion index with spray pattern in total pounds of 2,4,5-T applied by month, 1972-77.

that we decided that what we had found was significant enough to ask for help."



David Beckstead

Her plea for help was the enclosed letter, signed by all eight women and accompanied by Bonnie's charts, mailed in May, 1978. "We didn't know exactly who might be the appropriate agency, so we decided to send copies of the letter to all agencies who we thought would have a concern in the matter. . . ." Most of the women who signed the letter did not know each other, and of them all the only ones I know are Bonnie, and Debbie Marano, who lives here in our valley, where the Forest Service has been spraying for years. Debbie had four miscarriages between 1975 and 1977, and in two other tenant households on the land her rented house occupies, one man died of cancer last year, and another, a young mill worker who buys eggs from me, was told two weeks ago he has terminal cancer. As Bonnie says, you can't prove a cause and effect relationship, but it sure makes you wonder. Last year, Debbie gave birth to her first child, after months of worry over an EPA study (later denied by EPA) that found 92 parts per thousand TCDD in her garden soil. She is still waiting for results of a milk sample EPA took from her last year for testing.

Soon after Bonnie mailed her letter, the media got hold of the story, and perhaps under pressure from the publicity, EPA sent a team of epidemiologists to Alsea to interview the eight women and conduct questionnaires. Bonnie was dissatisfied – she had hoped for a more comprehensive survey of the area, gathering statistics from doctors and hospitals, more complete spray data. Norty Kalishman, the Benton County Health Officer, was not satisfied either. Norty is the pediatrician who came over one night to patch up Joe the Stallion's leg when he busted an artery. That's the kind of doctor he is. He lives with his family over the ridge from us, in Lobster Valley. "You have to get involved, take the risks," he says. "You can't hide and refuse to deal with things – with war, with the capitalism that promotes it. Farm workers, factory workers, people getting sprayed – we're all victims. The profit-based health system doesn't work. What they call health care isn't health care, it's *disease* care. You have to look for ways to use what you know, to improve your environment, to teach others to. That's what true health care is: caring. . . . Government agencies, professors, universities – you know they're interrelated, buying each other off. You have to start with the assumption that some of them are not to be trusted. We knew some of them had had experience with Agent Orange in Vietnam, and TCDD in Seveso. And we knew what they *should* be doing here. We were effective because we yelled and screamed and insisted on the testing and surveys being done right. Those first questionnaires were inadequate. Alsea II (the larger study) was done because we yelled and screamed. I was awful, I was rude, I ranted at them over the phone, bullied them into it. That's the only way you can get them to move . . . it was the same with the water samples." (More about those in a minute.)

So EPA, under pressure from one angry pediatrician, eight persistent women, and the media, which braved the wilderness to follow it all, conducted their studies and declared the ban on 2,4,5-T and silvex. Everyone sat back and sighed with relief, thinking all was over. Not so. Two weeks ago the results of the water samples taken by EPA at Norty's insistence were released. Of eight samples, one of the two taken in Five Rivers was positive. The silt from the water supply of Irene Durbin and her family, who live up the road from Debbie Marano, showed 10 - 20 ppt TCDD – three years after the last spraying in her area.

"There has been TCDD found in our water supply," Irene says. "Dr. Savage of Colorado University has called and told me that he didn't feel we should drink the water. But we've *been* drinking it all these years! We've lived in this place seven years. I've had two miscarriages, and a placenta previa that ended in a caesarian birth and a premature baby with lung problems and an undeveloped liver, among other things. It bothers me most that there is no alternative once our water supply has been contaminated. And if it's too late for my family – if the spraying can be stopped now – maybe it won't be too late for someone else."

The occasion for those remarks was a meeting here at the schoolhouse yesterday after the Forest Service had informed households up and down the valley that they were about to spray the surrounding forests with 2,4-D, Amitrole, and Krenite. Five years ago, the same community met with the Forest Service to confront them over the dangers of 2,4,5-T, silvex, and 2,4-D, and were met with complacent assurances of safety. Now that the EPA has recognized the hazards of 2,4,5-T and silvex, Forest Service credibility on the subject of other sprays is seriously undermined, and with good reason: 2,4-D was sprayed along with 2,4,5-T and silvex in the area of the Alsea study and could have contributed to the miscarriages, and studies from Sweden and this country implicate it as a

potent carcinogen. (Amitrole and Krenite are largely unstudied, which doesn't inspire confidence, either.)

With one exception, the people who met here were parents, most of them women. Their overwhelming concern was their children. "What are the long-range effects of these sprays? Will my children grow up to be sterile? Will they have cancer? How do they know what it may or may not do to children?"

"So this stuff is in our water, on our food, in the air. So my kids look OK. What about *their* kids? Or the ones after? Maybe this is how it'll all end, nothing but mongoloids in 80 years, they won't even be able to walk . . . and when they die, when we all die, we'll be buried and our bodies won't even break down, we'll be so full of chemicals."

"And the elk will dance for joy . . ."

"If there are any elk left."

And so on Wednesday evening we confront the Forest Service again. But this time with considerably more public awareness behind us. I'll let you know how it all ends. If it does. Good grief, I'm tired of it. Is there no limit to what they can roll at us? I sit here typing, phoning, answering questions, looking things up, and I look out at the trees, the foal in the meadow, and wonder what happened to the time to live, the time to sow, the time to reap. ■

Postscript, May 20

It appears now that USDA is going to enter the cancellation proceedings as intervenor for Dow against EPA, how's that for unity in government! There is going to be this symposium in Portland June 15, a most important one it seems. On Wed. morning at 4:30 a.m. I was wakened by a TV crew who wanted to film a spraying operation. I called a logger neighbor who came over and we did some quick sleuthing and with the help of blind luck were able to locate where the Forest Service was spraying that day (they are very secretive about when and where they are going to spray on any given day), so when we turned up at the unit with all this TV gear, boy were they surprised.

We filmed them spraying the whole unit and did some interviews – it was a good show, including a shot of the helicopter spewing 2,4-D right over Ryan Creek, the water supply of a family who had begged the Forest Service to change their plan and even offered to brush the unit manually for free. All for the cause, we got doused with the stuff ourselves in the course of filming it. I haven't recovered yet.

I see more and more that to save the world, or even a little corner of it, one has to sacrifice any notion of a personal life, the problems are so vast and complex the only people who can deal with them are those without families, without a self, without even a goldfish to require attention. One has to be a monk. I don't want to be a monk, I want to have a family and a garden and animals and teach school, and I end up writing rebuttal testimony or lugging 80 pounds of TV equipment up a clear-cut at 6 a.m. Will there ever be an end to it?

–CVS

The Alsea letter

April 11, 1978

Dear

We are eight women who have lived in the Alsea area. We are virtually surrounded by Forest Service, BLM, and private timber lands (mostly Starker and Willamette), all of whom have sprayed literally thousands of acres for years with dioxin-containing herbicides in the spring months of February through April (although the Forest Service also sprays in May, June, and through the summer into September).

The eight of us have suffered a total of ten miscarriages in the spring months, starting in 1973. Of course, a certain rate of miscarriage would be normal, but for a population our size (under 1,000), it seems more than coincidental that so many of us have miscarried only in the months of March through early June. We have found only one miscarriage that occurred at any other time of the year. (It happened in October to one of us who lives in an area sprayed in September of that year.)

We have charted the dates of our miscarriages with the dates that these four agencies and industries have sprayed dioxin-containing herbicides, and an incredibly close correlation exists. We are not trying to make rash, unsubstantiated claims, but are interested in seeing if there is a cause-effect relationship. Some of us do know that large acreages near our homes and in our water drainages were sprayed within a month before our miscarriages.

Each of us was under the care of a physician at the time of the miscarriage, and none of our doctors could offer any explanation for the miscarriage when it occurred. None of us, including our doctors, had thought of the herbicides as a possible threat, or we certainly would have had tests done. In retrospect, two of our doctors have said that they would consider the herbicides as a possible cause of our miscarriages. Even the latest Forest Service Environmental Impact Statement admits on page 88 that "All chemicals are capable of causing toxic effects upon the developing embryo . . . Chemicals can become available to the embryo in spite of the mother's excretion and metabolism capabilities."

We are in the process of more research into the problem because we have been able to contact only a relatively small number of women, and cannot help but wonder if there have been more miscarriages in our area. We are not affiliated with any organization or group, and feel that we are unable to do a thorough, adequate job of researching the problem ourselves; we are more than willing, therefore, to cooperate with any agency, group, or industry who would like to help. We realize that many factors can contribute to any miscarriage, but are anxious to determine if the herbicides are one of them.

There are just too many unknowns about the sprays; some laboratory tests have apparently indicated that the dioxins are related to cancer, birth defects, abnormalities in the reproductive systems of adolescents, and a general lowering of peoples' resistance to infection and disease.

Until the herbicides are proven safe, we feel very urgently that their use must be stopped in Oregon. Let's follow the example set by the Oakridge City Council, who demanded that their area not be sprayed. We can certainly afford to be cautious where human health and lives are possibly endangered.

Sincerely,

Bonnie Hill	Patty Zetzman
Verla Ritchey	Becky King
Pat Hendrix	Carol Feyerherm
Sally Bourne	Debbie Marano

NCAP News

For excellent coverage of the Northwest biocide battlefront, get N.C.A.P. News *quarterly, $5/yr. from the Northwest Coalition for Alternatives to Pesticides, Box 375, Eugene, OR 97440.*

–SB

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—SB
[Suggested by Gary Snyder]

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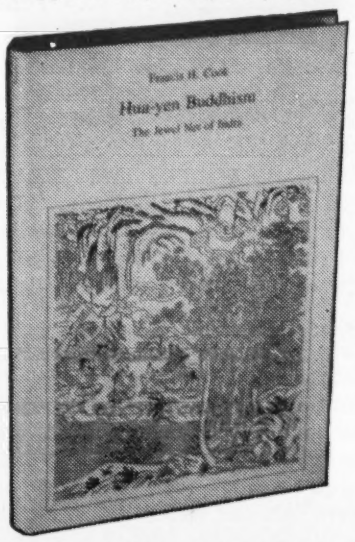
University Press
215 Wagner Building
University Park, PA 16802
or Whole Earth



We may begin with an image which has always been the favorite Hua-yen method of exemplifying the manner in which things exist. Far away in the heavenly abode of the great god Indra, there is a wonderful net which has been hung by some cunning artificer in such a manner that it stretches out infinitely in all directions. In accordance with the extravagant tastes of deities, the artificer has hung a single glittering jewel in each "eye" of the net, and since the net itself is infinite in dimension, the jewels are infinite in number. There hang the jewels, glittering like stars of the first magnitude, a wonderful sight to behold. If we now arbitrarily select one of these jewels for inspection and look closely at it, we will discover that in its polished surface there are reflected *all* the other jewels in the net, infinite in number. Not only that, but each of the jewels reflected in this one jewel is also reflecting all the other jewels, so that there is an infinite reflecting process occurring. The Hua-yen school has been fond of this image, mentioned many times in its literature, because it symbolizes a cosmos in which there is an infinitely repeated interrelationship among all the members of the cosmos. This relationship is said to be one of simultaneous *mutual identity* and *mutual inter-causality.*

The Observer's Spaceflight Directory

A peerless reference book for all who deal with space. I wish to hell I'd had it when we were putting together our **Space Colonies** *book. Once again, the Brits are not ashamed to enthuse about space, to revel in the details of humanity's expanding edge. When I was on a tall square-rigged ship recently, I found myself thinking of it as an old spaceship, no more or less lovely and fascinating than the new ones.*

—SB

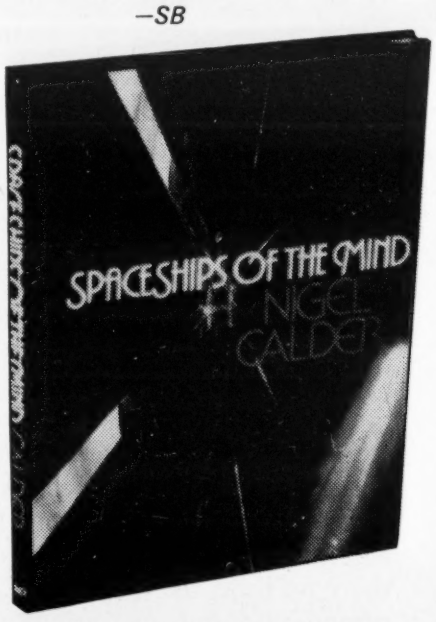
The Observer's Spaceflight Directory
Reginald Turnill
1978; 384 pp.
$15.00 postpaid
from:
Frederick Warne
and Co., Inc.
101 Fifth Ave.
New York, NY 10003

Spaceships of the Mind

If you're considering space as a realm of activity for yourself or Ourself, there's no point in thinking small. The old professional British explainer Calder does an admirable job of mustering all the relevant thought and experience that bears on the idea of space colonies and beyond. E.F. Schumacher detested the thought.

—SB

Spaceships of the Mind
Nigel Calder
1978; 144 pp.
$14.95 postpaid
from:
The Viking Press
299 Murray Hill Pkwy.
East Rutherford, NJ
07073
or Whole Earth



To colonise space will be to take out insurance policies. With humans living in an immense variety of widely separated environments, whatever catastrophe might occur in one place, it surely will not occur in others. If the human species accepts the challenge, it has the opportunity to become perhaps immortal, for as long as the universe lasts. Smith found it hard to imagine anything other than an encounter with another civilisation that would stop the expansion of life filling the Galaxy.

•

The chief factor determining the rate of human expansion through the Galaxy will probably not be the speed of the ships, but the breath-catching period between the colonisation of one star and the departure for the next. Tom Kuiper and Mark Morris of Caltech assumed a 'regeneration time' of 500 years after each step of ten light-years, and a travel speed of ten per cent of the speed of light, to arrive at a figure of five million years for a technological civilisation to populate the Galaxy.

•

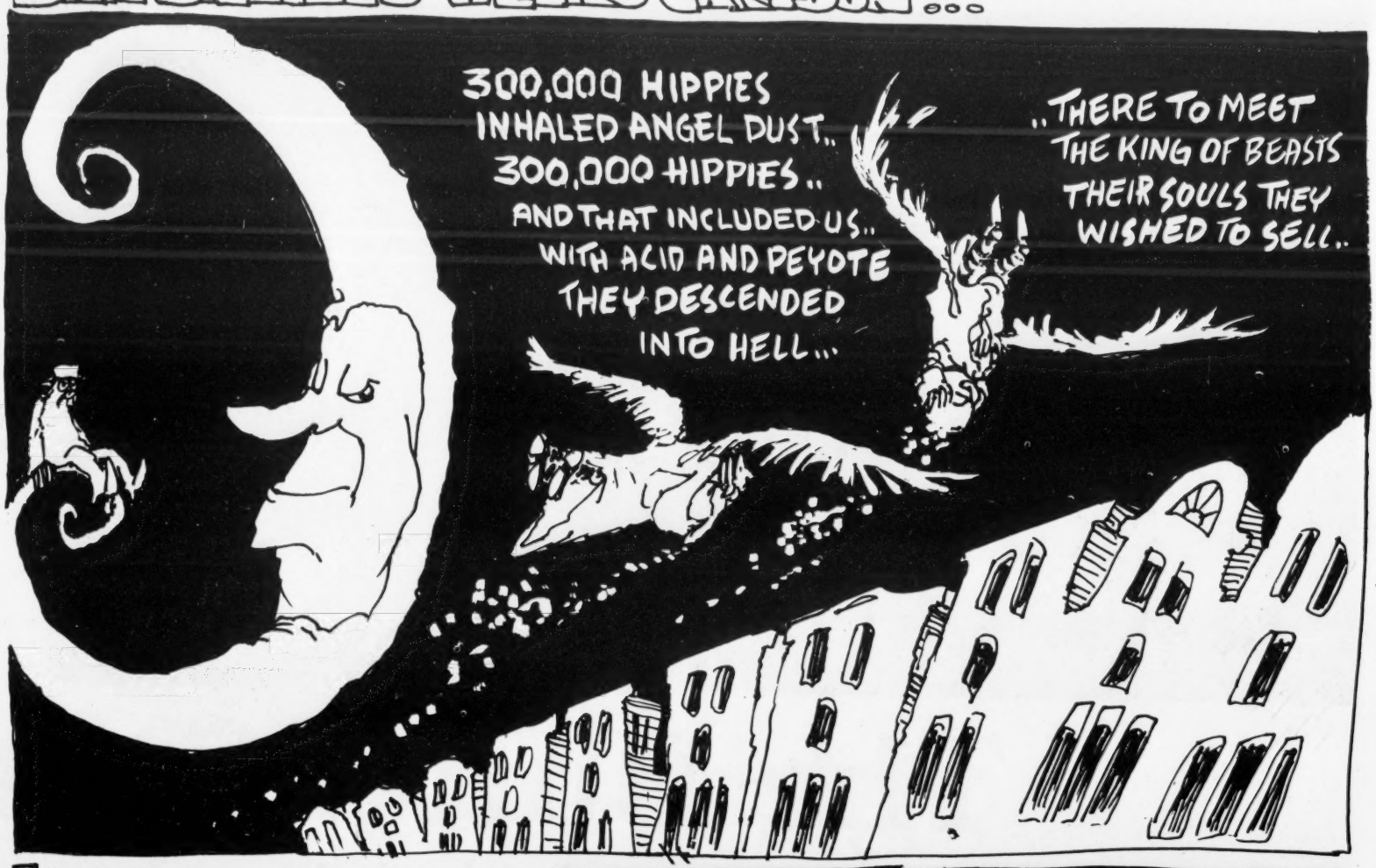
Compare the shoeshine man and the forester: the first works for a minute or two and gets prompt payment for a gleam that will not survive the next shower; the forester, on the other hand, plants trees that take so long to grow that he cannot live to harvest them. With the industrial revolution, forestry went out of fashion. Most of us, in the countries where it happened, began to live like shoeshine men. 'Better fifty years of Europe than a cycle of Cathay,' Tennyson declared. But people will have to learn patience again, if they are to take over the Solar System and then the Milky Way. It will mean planting many trees, both literally and figuratively.

WORLD SPACE CENTRES

Successful Launch Total by Site 1957–1976

Place	Earth Orbit	Lunar or Escape	Total
Plesetsk, Russia	494		494
Tyuratam, Kazakhstan	370	49	419
Vandenberg AFB, California	395		395
Cape Canaveral, Florida	207	53	260
Kapustin Yar, Russia	64		64
Wallops Island, Virginia	16		16
Indian Ocean Platform, Kenya	8		8
Shuang Cheng-tzu, China	7		7
Uchinoura, Japan	6		6
Kourou, Guiana	6		6
Hammaguir, Algeria	4		4
Tanegashima, Japan	2		2
Woomera, Australia	2		2
Total	1581	102	1683

DAN O'NEILL'S WEIRD CARTOON...



The Butterflies o

With fine-grain, long-term field study ecological g

By Paul R. Ehrlich

EACH SPRING ON JASPER RIDGE, a grassland island of serpentine soil surrounded by a sea of chapparal on the Stanford campus, checkerspot butterflies emerge from their pupae to fly, mate and lay eggs. Starting in the spring of 1960 I began to study these butterflies, *Euphydryas editha,* in an attempt to shed light on some of the unanswered problems of population biology.

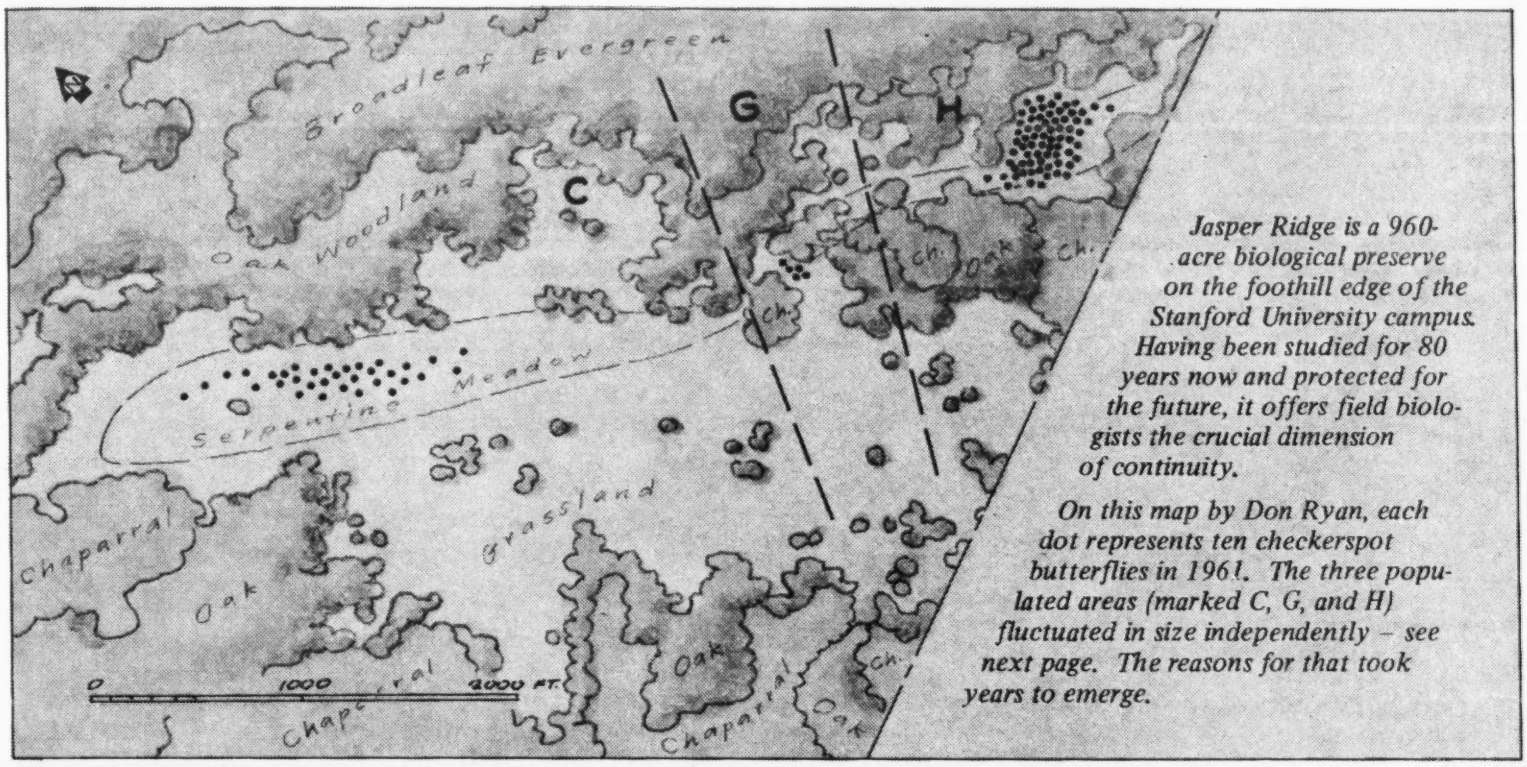
Two basic questions of population biology are: What controls the distribution and abundance of plants and animals? And how do plants and animals respond genetically to environmental changes; in other words, how do they evolve? Although our stake in manipulating populations of both beneficial and harmful organisms makes these questions of great practical interest, progress in answering them has been depressingly slow.

Paul Ehrlich is a population biologist in two senses. One is the environmentalist sense of his books **The Population Bomb** *(1968),* **The End of Affluence** *(1974), and* **Ecoscience** *(1977). The other is the ecologist sense of his many technical papers on evolution, his co-invention of the term "coevolution" with botanist Peter Raven, and his remarkable work on Stanford's Jasper Ridge and in the Colorado Rockies with butterfly populations. I don't think I've seen a better piece on doing ecology – how young (and sometimes presuming) a science it really is, how painstaking productive research must be. The article is reprinted from* **The Sciences**, *Nov., 1978 ($12.50/yr. from 2 East 63rd St., New York, NY 10021 © 1978, The New York Academy of Sciences).* –SB

The major reason for the lack of progress is insufficient data. The size, spatial organization and genetic properties of representative samples of plant and animal populations have not been properly determined. Nor have changes in these characteristics been traced for substantial periods of time.

In the nineteen-fifties, what knowledge there was of the evolution and dynamics of natural populations was based on a small, rather biased set of examples. Selection – the differential survival or reproductive success of different genetic types – had been demonstrated in only a few cases outside of laboratories, cases in which some unusual circumstance permitted the process of genetic change to be easily observed or strongly inferred. The most famous example is the evolution of "industrial melanism" in British moths under the impact of pollution. In polluted woods, speckled moths were more likely to be eaten by birds than were melanic moths, and the formerly rare melanics became common in industrial areas.

In part the reasons that only such easily available examples were seized on lay in the sociology of science. To do detailed, long-term studies of evolution in nature, an investigator must have access to populations year after year. Virtually no graduate student and relatively few junior faculty are assured of the permanence that allows such a long-term research commitment. Furthermore, in a long-term study, results may be slow in coming, and most scientists are under pressure to obtain results quickly and to publish. Tenure and promotion committees and



Jasper Ridge is a 960-acre biological preserve on the foothill edge of the Stanford University campus. Having been studied for 80 years now and protected for the future, it offers field biologists the crucial dimension of continuity.

On this map by Don Ryan, each dot represents ten checkerspot butterflies in 1961. The three populated areas (marked C, G, and H) fluctuated in size independently – see next page. The reasons for that took years to emerge.

s of Jasper Ridge

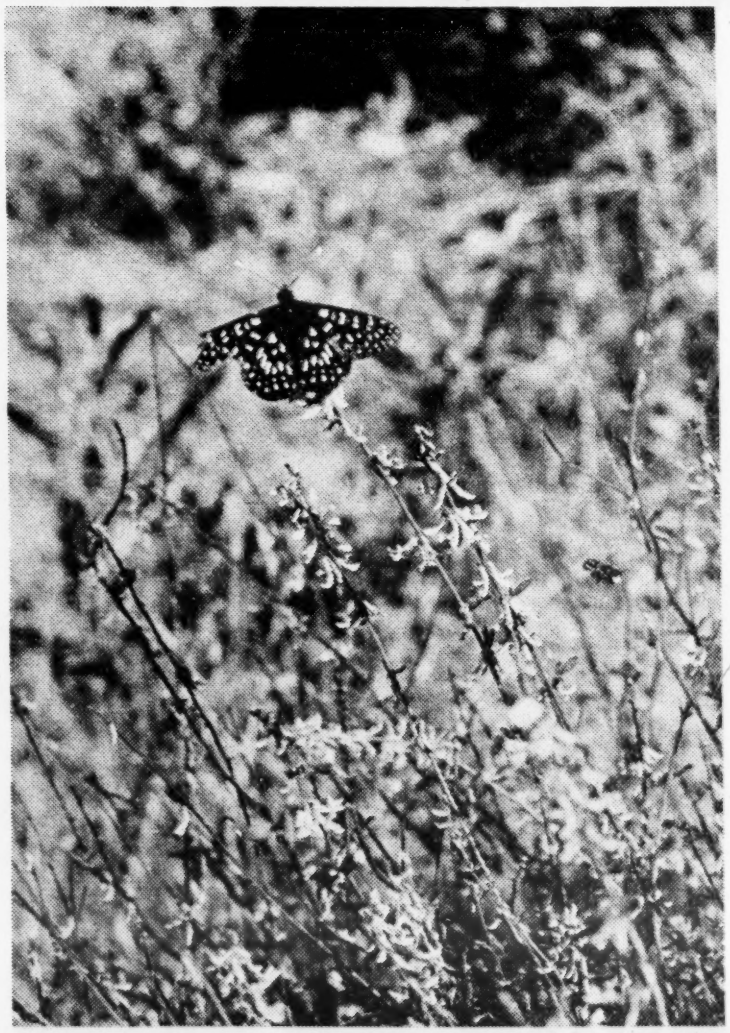
al generalizations dissolve (and theory improves).

the peer review panels of granting agencies all look at publication records.

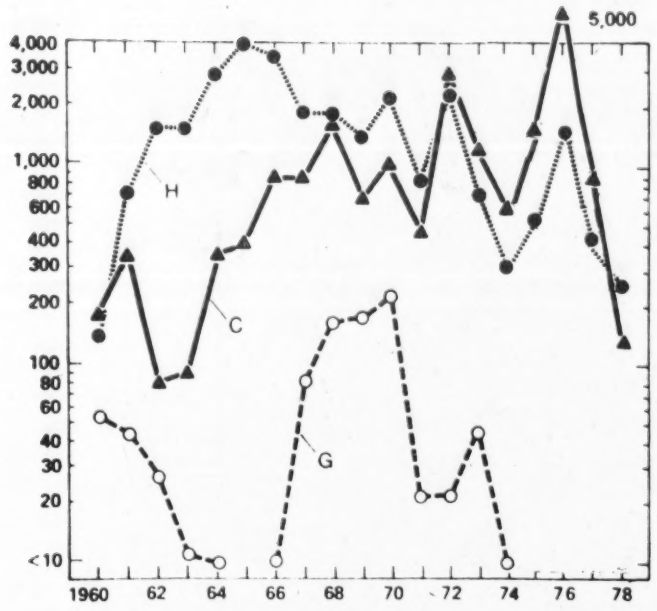
A different bias has afflicted studies of the dynamics of populations, which have been largely restricted to organisms of economic importance: deer, mountain sheep and other game; lynxes and their rabbit prey in northern Canada; forest insect pests in Canada and Germany; and populations of commercially harvested fish are examples. Long-term studies of the genetics and dynamics of the same population had not been attempted before 1960.

The checkerspot butterflies, therefore, offered a special opportunity. They were not commercially important, nor were they particularly noticeable because of some dramatic change in the size of the population or the speed of their evolution. Although I was untenured, I decided to gamble and undertake a long-term study.

Since the spring of 1960, our research group has worked continuously with the Jasper Ridge checkerspots. In *E. editha*'s cycle, the caterpillars, or larvae, hatch from eggs in late spring and feed on *Plantago erecta*, a native annual plantain. The young larvae go into a resting period, or diapause, during the dry California summer after the plantains bloom and die. When the rains return, a new generation of *Plantago* sprouts and the larvae "wake up," return to feeding, form their pupae, and then, in March and April, emerge as adults to mate, lay eggs and start the cycle over again.



The checkerspot butterfly Euphydryas editha



Wide and independent fluctuations of the three populations of checkerspots on Jasper Ridge (see map on previous page).

Our work, done during the spring flights, consists, in part, of "mark-release-recapture" experiments. Each captured adult is given a coded number with a felt-tip marker, and its condition and location of capture are recorded. Then the butterfly is released. By noting the proportions of recaptured individuals in successive samples and the locations of recaptures, estimates of population size and patterns of movement can be obtained.

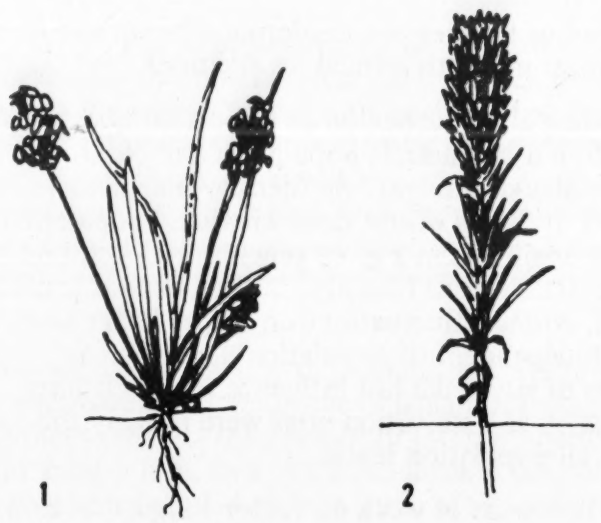
In 1960, the data showed that, rather than a single population occupying Jasper Ridge, there were in fact three separate populations with little interchange of individuals. And in subsequent years it became clear that each population behaved as an independent demographic unit. Size changes in these populations were not synchronized. Indeed, while two groups were expanding, the third population became extinct.

Rather than a single population of checkerspot butterflies on Jasper Ridge, there were in fact three separate populations with little interchange of individuals.

Our findings, which pointed up the importance of defining population structure, had implications for some very practical problems. For example, designing an appropriate harvesting strategy for the Peruvian anchoveta fishery (which has supplied as much as seventeen percent of the annual worldwide harvest of marine fishes) is hindered by ignorance of the number of stocks (or populations) involved. Similarly, sensible decisions about the exploitation of whales depend in part on understanding their population structure.

Such knowledge is necessary for determining changes in population size. Had the existence of three separate demographic units not been recognized in the studies of the butterflies on Jasper Ridge, entirely different, and entirely wrong, conclusions about their population dynamics would have been drawn. Attempting to understand the reasons for changes in population size without identifying demographic units is rather like trying to evaluate the function of thermostats in several different aquaria by taking water samples from each, dumping them into a common container, and measuring the temperature of the mixture. Failure to recognize demographic units has made most of the information in the ecological literature on fluctua-

I had told my students that *Plantago* was the food plant, and they believed me.



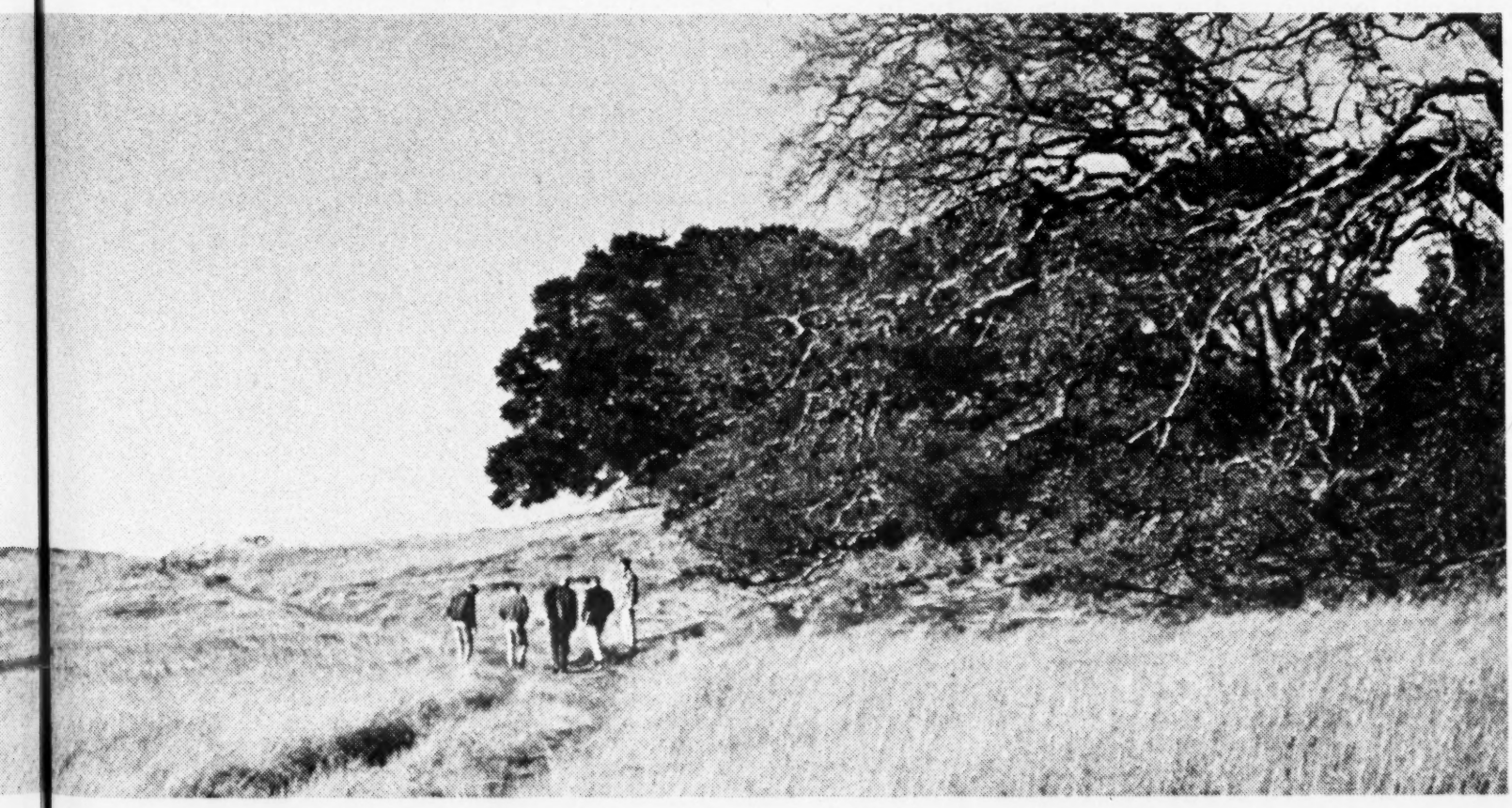
The two food plants of the checkerspot, Plantago erecta *(1) and* Orthocarpus densiflorus*(2), which were found to have the greatest effect on butterfly population size.*

tions of numbers virtually useless for answering questions about how population size is "regulated."

What caused the changes in population size in these butterflies? Because of the difficulty in finding and keeping track of eggs and young larvae, the answer was unexpectedly elusive. But by 1970, Michael Singer, now of the University of Texas at Austin, had solved the mystery. Singer showed that the vast majority of *E. editha* larvae starved to death when the *Plantago* dried up and the larvae were still too young to go into diapause. The larvae that survived to go into diapause did so by one of three possible routes. Some came from eggs laid very early in the season and reached the required size for diapause before the *Plantago* dried up. Others came from eggs laid on *Plantago* that was growing in gopher-tilled soil. In such soil, root systems were deeper and the plants remained green longer. And yet others circumvented the loss of primary food by finding owl's clover *(Orthocarpus densiflorus)*, on which they could feed until they reached diapause size.

Of the three roads to survival, the owl's clover route is most important. Indeed, as the work of Ray White, now at Old Dominion University in Norfolk, Virginia, showed, the size of a Jasper Ridge *E. editha* population in a given year can be predicted accurately by the density of owl's clover in the preceding year. Singer's work also solved a longstanding puzzle – why *E. editha* populations around Stanford were always found in areas of serpentine soil even though *Plantago erecta* was not restricted to serpentine. I had developed several hypotheses, all of which were totally wrong. The simple answer was that owl's clover was restricted to serpentine soil.

The discovery of a critical secondary food plant taught me an important lesson. I had been told that *Plantago* was the food plant of *E. editha* at Jasper Ridge; that information was found in the literature, and I had successfully raised the butterflies on *Plantago*. I had told my students that *Plantago* was the food plant, and they believed me. Our collective mindset had



prevented us from even considering other possibilities until Singer made his critical observations.

The finding also touched on an important question of population dynamics. Is population size controlled in a "density-dependent" or "density-independent" manner? In other words, does whether a population expands or shrinks in a given generation depend on the population's size (density) in the previous generation? *E. editha*'s fluctuations on Jasper Ridge were clearly independent of population density. The numbers of larvae did not influence the availability of *Plantago*, and starvation rates were roughly the same at all population levels.

After a few years of work on Jasper Ridge, it became clear that we would eventually know a great deal about the ecology of local *E. editha* populations; but we would not know what it meant. Were the Jasper Ridge populations typical of *E. editha*? Of all *Euphydryas*? Of all butterflies? Of all insects?

To gain a basis for generalizations, our group expanded its activities geographically and taxonomically. *Euphydryas editha* populations now have been studied all over California, in the deserts near San Diego, in the inner and outer Coast Ranges, in the Sierran foothills and above timberline. We have also worked with populations in Oregon, Nevada and, most recently, Colorado. Comparative studies of several other checkerspot species have been carried out in many parts of the West, and work has been done on some tropical butterflies to see if ideas generated by work on temperate species are applicable in the tropics.

One of our most significant findings is that, within the species *E. editha,* populations differ not only in their structure but in a large number of other ecological parameters. The larvae feed on different food plants, sometimes ignoring in one locality food plant species used in another; adult and larval behavior varies with location, as does population density. In some populations, size is generally controlled in a density-dependent manner, with either intra- or interspecific competition for food occurring. In others (such as Jasper Ridge) population "control" is density-independent, and there is no competition for food. Parasitism is a significant factor in some populations and not in others. In short, we have shown that the taxonomic unit *Euphydryas editha* is in no sense an ecological unit. Therefore, discussions of the ecology of a species based on experience with one or a few populations can be extremely misleading. The implications of this result for the management of populations of economically important organisms are obvious.

Documenting genetic changes in *Euphydryas* populations has proven much more difficult than investigating their ecological characteristics. Compared with other organisms used in genetic studies, such as fruit flies and mice, *Euphydryas* are difficult to rear and to cross, and they have a long generation time. In the early sixties, it was not possible to detect a series of "Mendelian" genes (such as those that control eye color in fruit flies) segregating in natural populations and undergoing frequency changes through time (a

Parasitism is a significant factor in some populations and not in others.

trick that has proven difficult even with organisms highly amenable to genetic analysis). Therefore quantitative genetic analyses were done using characteristics such as wing length, in the hope of being able to relate genetic and demographic changes – for example, to determine whether genetic variability is lost when population size becomes very small.

Our results were unsatisfactory, however, because heritability statistics are useless for comparisons of different populations or of the same population in different generations unless environments are known to be essentially identical. Since we could not assume that even different parts of Jasper Ridge were identical, we were unable to tell whether observed geographic or temporal differences in various characteristics were at least in part due to underlying genetic differences.

In 1966, however, the work of Richard C. Lewontin, now at Harvard, and J.L. Hubby of the University of Chicago, opened a new era in population genetics. They employed a technique called gel electrophoresis to detect genetic variants of enzymes (allozymes). In electrophoresis, an electric field is used to separate the variants, which move different distances because of different electric charges. Lewontin and Hubby uncovered a surprising amount of genetic variability in neutral populations of fruit flies. Electrophoretic techniques were quickly adopted in other laboratories, and in less than a decade it became clear that the patterns of variability found in *Drosophila* were widespread in both plants and animals.

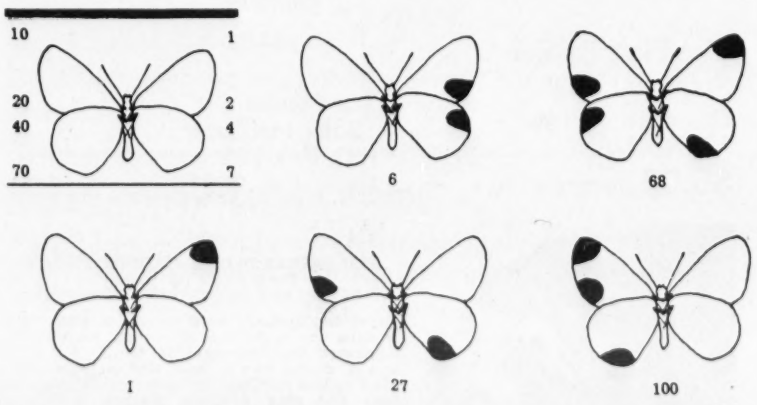
Along with this discovery came the "neutralist-selectionist" controversy. "Selectionists" claim that this great variability is almost entirely a product of natural selection. "Neutralists," on the other hand, suggest that the variation is due mainly to mutation, migration, and random genetic drift occurring after selection has removed unfavorable mutations. The

Not only is the species not an ecological unit, it is also not a genetic unit.

questions are: are most of the small changes (amino acid substitutions) in the enzymes that cause the different mobilities in electric fields unimportant enough not to be detected by selection? Or do almost all such substitutions cause significant differences in the survival and reproductive capabilities of their carriers? The answer is still in doubt, partly because of deficiencies in the theory predicting what patterns should occur under either hypothesis and partly because of the inadequacy of data on patterns of gene flow between natural populations.

Needless to say, our group rapidly undertook electrophoretic analysis of the checkerspots. There were technical difficulties for several years, but Stephen McKechnie, a postdoctoral fellow (now at La Trobe University in Melbourne, Australia), solved them, and we were at last able to investigate some genetic characteristics of *Euphydryas* populations. Fortunately, one of our earliest concerns had been to determine not only the dimensions of demographic units in *Euphydryas*, but also those of genetic units as well. Various lines of evidence indicate that there is little or no gene flow between most populations of *E. editha.* Over the years, mark-release-recapture studies have given us a good idea of patterns of movement of individuals, and in general they stay put. Furthermore, investigations of reproductive biology and ecology indicate that the chances of occasional migrant individuals making a genetic contribution to the recipient population are not high.

For example, one of my first students, Patricia Labine, discovered that male *Euphydryas,* after copulation, apply a "plug" which reduces the probability of a female being inseminated a second time. In a clever series of experiments, she demonstrated that when there was a second mating, only sperm from the second male would fertilize eggs laid subsequently – making it clear why the first male applies the "chastity belt." But in protecting his genetic investment, a local male also makes it less likely that an immigrant male will be reproductively successful. Most females are first inseminated by local males immediately after emergence. Second inseminations, if they occur, are delayed until the first plug deteriorates, and the offspring resulting from second inseminations have a greatly reduced probability of successfully reaching diapause size.



The marking technique used on Jasper Ridge for capture-recapture study. With a "Magic Marker" and the "1-2-4-7" marking system, up to 154 individuals can be distinctly labeled.

Thus we have been able to examine gene frequencies of populations whose degree of isolation from one another – that is, the amount of interpopulation gene flow – is known. This has made it possible for us to determine that at least some of the patterns of population-to-population enzyme variation in *E. editha* were under selective control, and probably many of the others were as well. Butterfly populations in places as different as California deserts and mountain meadows of Colorado not only look alike but show remarkable genetic similarities, even though they have been completely isolated from each other for many thousands of generations. While one can imagine that selective forces, despite the different environments, were similar enough to maintain the similarity of the populations, the neutral mechanisms of gene flow, mutation or random drift, if they were the controlling processes, should have led to differences greater than those observed.

The old idea that species are evolutionary units bonded together by gene flow simply does not apply to *E. editha.* Not only is the species, as we saw earlier, not an ecological unit, it also is not a genetic unit.

At this writing, however, it is not clear that the neutralist-selectionist question can be settled with complete assurance with the sort of information we have gathered for *Euphydryas.* If this information is insufficient, then the neutralist-selectionist dispute is unlikely to be resolved without some unforeseen breakthrough, and continuing to determine allozyme frequencies in different populations of organisms (virtually all of which are less well known than *E. editha*) is probably a waste of time.

What has become clear, however, is that long-term studies need not be a gamble – discoveries made along the way provide more than enough grist for publications to satisfy deans and granting agencies.

During the nineteen years we have been working on *Euphydryas editha,* the science of ecology has been transformed by the emergence of a group of excellent theoreticians and by the generation of a considerable body of exciting theory. But general answers to the basic questions posed from the very beginning are still not in hand – largely because of the need for more information from intensive long-term studies of the population biology of selected groups of organisms. I have the growing suspicion, however, that the most general answer will turn out to be that the factors controlling the distribution and abundance of organisms varies greatly from population to population, but in most populations, selection – rather than gene flow, mutation or random drift – is the overriding evolutionary force. ■

Box 428, Sausalito, CA 94965

Soft Technology

New Inventions in Low-Cost Solar Heating

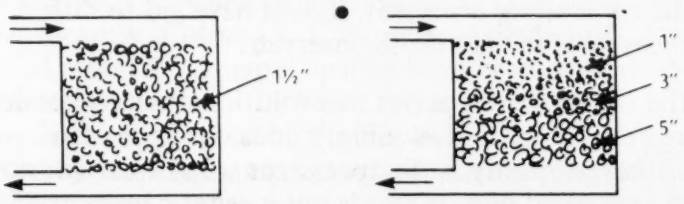
No less than a hundred unusual designs, mostly unproven, but all with considerable potential, are presented with wit and skill by the now famous Dr. Shurcliff. I won't presume to describe anything; you'll be wanting to buy this book anyway if solar tinkering is your game. Of all the solar books I've looked at in the past few years, this is the most exciting by far; actually hard to put down once you start reading. Highly recommended. —*J. Baldwin*

New Inventions in Low-Cost Solar Heating
(100 Daring Schemes Tried and Untried)
William A. Shurcliff
1979; 293 pp.
$12.00 postpaid

from:
Brick House Pub. Co.
Church Hill
Harrisville, NH 03450

The inventions described here deal with low-cost solar heating systems. They deal with passive systems, active systems, and combination passive-and-active systems, including some instantly convertible passive-to-active systems. Of the active systems described, some employ air and some employ water. Some employ flat-plate collectors and some employ concentrating collectors. Some of the inventions are concerned just with thermal storage systems: water-filled tanks, bins-of-stones, bins-of-water-filled bottles, and containers filled with phase-change materials such as Glauber's salt or hypo.

Most of the solar heating systems described are for space heating. A few are for domestic hot water.



Conventional bin. Vertical cross section

Bin employing three sizes of stones

Bin-of-Stones Employing Three Sizes of Stones in Three Zones to Increase Thermal Capacity and Pneumatic Conductance

Proposed Scheme

Divide the bin-of-stones into three zones and use different size stones in each. In the top, middle, and bottom zones, use stones having average diameters of 1 in., 3 in., and 5 in., respectively. The hot air from the collector is blower-driven *downward* through the bin; thus, passing first through the quantity of small stones and last through the large stones. Thermal performance is improved and the requirement on blower power is reduced. . . .

The top zone sees most of the action — it plays the most important role. In midwinter, when the amount of energy in the bin is small, the solar energy collected in a period of bright sunshine is delivered to the top zone of the bin, and when the rooms next need heat, heat is extracted from this top zone. Again and again it is the top zone that is active.

The bottom zone is seldom active. Usually it takes up energy only when the two superior zones are already fairly full of energy, which occurs mainly in fall and spring. The bottom zone may be regarded as a kind of stand-by component, storing energy only when there is near-surplus.

Yet the pneumatic conductance of the bottom zone is no greater than that of the top zone.

In summary, the bottom zone is much less useful, yet imposes the *same* burden on the blower.

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I suggest that the government drop all financial inducements in this field: provide no inducements for active systems or passive systems. Then the whole problem evaporates. And people who find how to build and install truly cost-effective systems will do so, and those who do not will abstain. Architects and solar designers can forget about 1000-page rule books and high-paid lawyers and can go back to what they are fitted for: building systems that are even more clever, even more cost-effective.

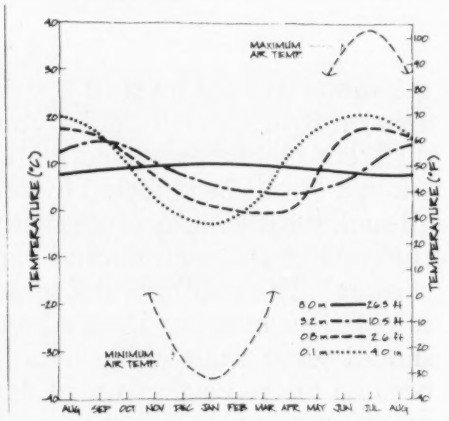
Earth Sheltered Housing Design

In contrast with previous underground building books however good (Malcolm Wells), this one is a manual of proven procedures; what to do. It's a good one too, though obviously not the last word. More like the second word. It's enough, though, to let you actually design an underground structure with a degree of confidence. That's saying a lot. It is commendably comprehensive and a good value for the money.

—*J. Baldwin*

Earth Sheltered Housing Design
(Guidelines, Examples, and References)
The Underground Space Center
University of Minnesota
1979; 318 pp.
$17.95 postpaid

from:
Van Nostrand Reinhold Co.
Order Dept.
7625 Empire Dr.
Florence, KY 41042
or Whole Earth



Soil temperature distribution.

The great recent interest in earth sheltered housing has resulted primarily from anticipation of substantial energy savings. In typical above ground construction energy is wasted by unwanted heating or cooling of the surroundings. By reducing heat transfer to and from the surroundings less energy is required to maintain desired conditions. Heat loss (or gain) from a structure principally depends on two factors: the ventilation load for heating or cooling intake air, and the heat transmission through the building envelope. In most residences the ventilation load consists of uncontrolled air infiltrating through cracks and holes. These infiltration losses are reduced greatly or eliminated by earth covered construction. Ventilation air then can be controlled so that heat recovery systems can be used effectively.

The First Passive Solar Catalog

David Bainbridge is one of the more active people in the Davis, California solar enterprises. He's written this "catalog" as a modest passive solar primer backed by a listing of suppliers of hardware appropriate to the cause, and a directory of architects who are knowledgeable on the subject. He promises that this is but the first of a series that will carry increasing access to sources of information, hardware and people. I hope he does this, as the field is rapidly changing. I also hope he can offer some critical assessment of the cataloged hardware in future editions. This catalog is useful but it would be more so with "reviews." It would also be good to see more examples from California. Nonetheless, it's a good start and should fill a need for many people working with passive solar design.

—*J. Baldwin*

The First Passive Solar Catalog
David Bainbridge
1978; 72 pp.
$5.00 postpaid

from:
The Passive Solar Institute
P.O. Box 722
Davis, CA 95616

NEW ENERGY SAVING AIR BOOSTER FANS
For 5", 6", 7", 8" and 9"
HEATING and AIR-CONDITIONING DUCTS

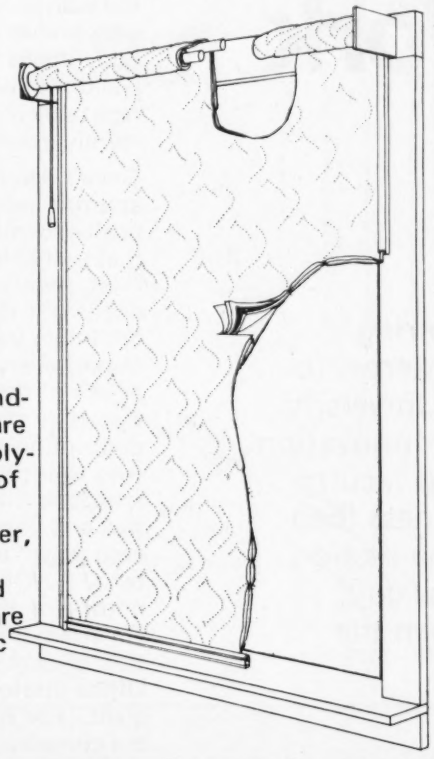
For rooms that are hard to heat or cool, booster fans can make the difference. Permanently lubricated fan cartridge fits all 5", 6", 7", 8" and 9" ducts. Fan is held and insulated by a foam rubber cuff, can be operated by attaching cord and plug or light dimmer switch for speed control. 5" fan (12 Watts) $18.75 each; 6" Fan (16 Watts) $18.75; 7" Fan (16 Watts) $19.50; 8" Fan (20 Watts) $23.00; 9" Fan (20 Watts) $23.70. Shipped pre-paid.

DALE AND ASSOCIATES Inc.
1401 Cranston Road, Beloit, Wisc. 53511

Window Quilt

Lots of people these days are interested in insulating curtains or shades. It would seem an easy thing to deal with, but, alas, it is not. Some curtains actually make heat losses worse by causing strong drafts along the glass surface. Many will work OK for awhile, only to deteriorate expensively in sunlight. Frankly, I don't know how long this one will last, but they claim it is made of materials that will stand up to abusive conditions. The edge sealing seems well thought out. In fact, the whole product seems to be well thought out (in contrast to all too many others). If you are using this material, I'd appreciate a report.

—J. Baldwin
[Suggested by William Hank]



Window Quilt

About $3.00/sq. ft.
from:
Appropriate Technology Corporation
P.O. Box 975
Brattleboro, VT 05301

The quilt is a five layer sandwich. The outside layers are decorative, UV resistant polyester fabric. Next, layers of polyester batting provide insulation. The center layer, a reflective vapor barrier, prevents condensation and reflects heat. The layers are laminated by an ultrasonic bonding process which doesn't perforate the vapor barrier.

Handmade Hot Water Systems

Supplanting **Blazing Showers** *(CQ, Winter '75, p. 58) as the best text on making hot water wasn't easy, but this book has done it. (And I suspect that it may be done by the same people, though I'm not sure). The chapters on solar water heaters are nothing new, but the woodstove waterheaters are treated in great detail that is not available elsewhere. Most of what is shown has been field tested, and the diagrams are among the most clear I have ever seen in any book, anywhere, on any subject. —J. Baldwin*

Handmade Hot Water Systems

Art Sussman and Richard Frazier
1978; 91 pp.
$4.95 postpaid
from:
Garcia River Press
P.O. Box 527
Point Arena, CA 95468
or Whole Earth

1979 Wind Access Catalog

The excellent **Wind Power Digest** *has a special issue (Winter '79) cataloging just about every available item of wind-related equipment.*

—J. Baldwin

Wind Power Digest

$6/yr., 4 issues
($2, single issue)

from:
Wind Power Digest
54468 CR 31
Bristol, IN 46507

Windows

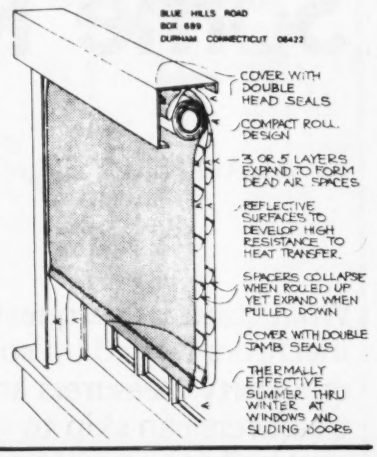
A new approach to technology transfer. An attractive irregular periodical intended to bring together all aspects of energy efficient windows: products and inventions available or needed, research opportunities and results, codes and legislation. Another purpose: "bringing 'grass roots' communications to the attention of those in the complex structure of federal, state, and local energy programs." If it works, and it will only if people interact with the publication as they do with CQ, it could do more to facilitate energy saving than a myriad of R&D or demonstration projects. Government money well spent. Good going LBL & DOE.

—Alan Kalker

Windows for Energy Efficient Buildings

Free (to those seriously interested)

from:
Energy Efficient Window Program
c/o Stephen Selkowitz
Bldg. 90 Rm. 3111
Lawrence Berkeley Lab.
1 Cyclotron Road
Berkeley, CA 94720



Preservation and Conservation Principles and Practices

We've shown many "preserve that fine old building" books in these pages, but most of them dealt only with the economics and politics of this desireable activity. This book tells you how to do the deed physically. Much of the information here is probably available elsewhere, but you could spend years collecting it. Some of the information is definitely of the sort one finds hidden in the experience of a very few noiseless experts toiling in the back rooms of small museums someplace. The book is the proceedings of a conference of restorers and architects (the first ever) held in Williamsburg in 1972. I felt like a real dummy reading it; these people know so much. There is considerable philosophic comment and a useful bibliography, too.

—J. Baldwin

Preservation and Conservation

(Principles and Practices)
Sharon Timmons, Ed.
1976; 547 pp.
$15.00 postpaid

from:
The Preservation Press
National Trust for Historic Preservation
740-748 Jackson Pl, NW
Washington, D.C. 20006

After the lapse of 100 years, it must be admitted that most of man's steel monuments have disappeared. Among these are the ships that were the first large steel structures built. . . .

Corrosion is not the only factor in the destruction of steel; one must also take into account the phenomena of fatigue. One wonders what the life-span will be for certain reinforced concrete works whose steel armatures are submitted to prestressing. Finally, one must not overlook the phenomena of corrosion caused by electric currents resulting from defective insulation.

•

Modern transportation adds a whole new range of mechanical forces to threaten the integrity of old buildings. Structures in the approach lanes of modern airports are subject to serious airborne vibrations from jet aircrafts; the Coliseum in Rome has been seriously damaged by the motor traffic that swirls around it; and the wooden piling that supports Venice is being eroded by the wave action of propeller-driven boats on the canals.

All of these facts indicate that the preservation of historic architecture is an integral part of the larger problem of the protection of the environment as a whole. The pathologies of the first are causally related to the pathogens of the latter: Therapy requires the control of both.

Inventors' Services: Some Really Work

BY ALAN KALKER

What started as a quest of interest mainly to aspiring inventors turned up some new information of interest to university treasurers and business theologians. University treasurers can skip to the section on "university innovation centers" for news of a challenge for students and faculty that can produce a new source of revenue. Business theologians may wish to ponder the indications in the section on "reputable invention managers" that the 'nice guy' style of business might produce more income than the ordinary big business style.

My quest was to find a way to get some inventions I had lying around out into the market place. One approach, suggested by J.D. Smith, was to make them freely available by publishing them, perhaps with a moral obligation on those who profited to return part of the profit to a foundation. To some, publishing a socially desireable invention is one way of keeping big companies from monopolizing and making a huge profit at the expense of the public. J. Baldwin recalled this was one of the motives for publishing the Domebook series. In retrospect he now feels this may not have been such a good idea. One reason why domes are not too common today may be that by putting most of the ideas in the public domain they removed much of the incentive for many to invest in mass production of domes and dome components. (Another reason, suggested by Stewart, may be that they are uncomfortable.)

J. now thinks the best way to get socially desireable inventions broadly available is to patent them. This is the approach used by Buckminster Fuller, J. noted, and Fuller has never had to sue for patent infringement. The problem with the patent approach is cost.

A preliminary patent search costs more than $125. Even if you learn to do the search by yourself at a regional patent library[1] a patent attorney or agent will probably set you back a minimum of $250. If a patent infringement suit is necessary, budget an additional $50,000. A growing alternative is the trade secret approach. While cheaper, it offers long-term protection only in fields like chemical processes and electronics where it is difficult to determine from the finished product the secret method used. Most famous example of a trade secret: the formula for Coca-Cola.

Which of the mutually exclusive methods of patents or trade secrets is best is, unfortunately, a complex technical-legal question.[2] Before spending money for a professional answer to that question, it would be nice to find out if you have any chance of recovering the cost of such professional advice.

Industry submissions

A positive response from industry could justify laying out some money for advice. Unfortunately for most inventors this should be the last step rather than the first. A survey of industry's response to unsolicited new product ideas indicates little uniformity – most common was a reluctant review to maintain good will. Many require the inventor to sign a waiver form before considering the idea. The only saving grace of many of these forms is that they are ". . . so blatant in their attempts to remove all rights from the inventor that they probably would not stand up in court."[3] The usual way around the waiver forms is to know somebody who knows somebody. That somebody could be a patent attorney, banker, university innovation center, reputable invention manager, or merely your neighbor.

Since hope blooms eternal and many attempt industry submissions without professional help, I'll outline the steps that will help minimize the damage. First, before any outside submission, document the date of invention. At a minimum you need a complete description of every known and speculated aspect of the invention, dated and signed by the inventor. The complete description must be shown to someone who is not a co-inventor who can understand the invention. That person must sign and date a notation at the end of each page "understood and witnessed by . . .". Optional at additional cost is notorizing the complete description. An alternate or additional documentation of date of invention is the Patent Office disclosure document filing program. For this you need two copies of the complete disclosure signed and dated by the inventor, a self-addressed stamped envelope, and a check for $10 payable to "Commissioner of Patents." Send the lot to the Commissioner, Washington, D.C. 20231. The Commissioner will stamp both copies, retain one for two years and return the other to you in about a month.

Second, prepare an abstract of the invention containing no proprietary information. ("Proprietary" is the polite business equivalent of "confidential"). Tell generally the type of invention and its expected advantages – how it is better, cheaper, or different than the competition. Omit all specifics and the secret of how such wondrous advantages are obtained. Exactly how much to disclose is a problem. You will not get far with the classic South Sea Bubble disclosure: "For an Undertaking which shall in due time be revealed." The abstract must be sufficient to disclose any potential conflict of interest. The recipient firm should be able to be sure that they are not already working on something similar to your invention. Receiving proprietary information from an outside source on a problem they are working on puts them in the difficult position of disputing a claim for payment for information they had already independently developed. Near simultaneous independent discovery or invention is remarkably common in science and industry. At any one time many are aware of current needs and current methods. It is not unusual for the connection between a particular need

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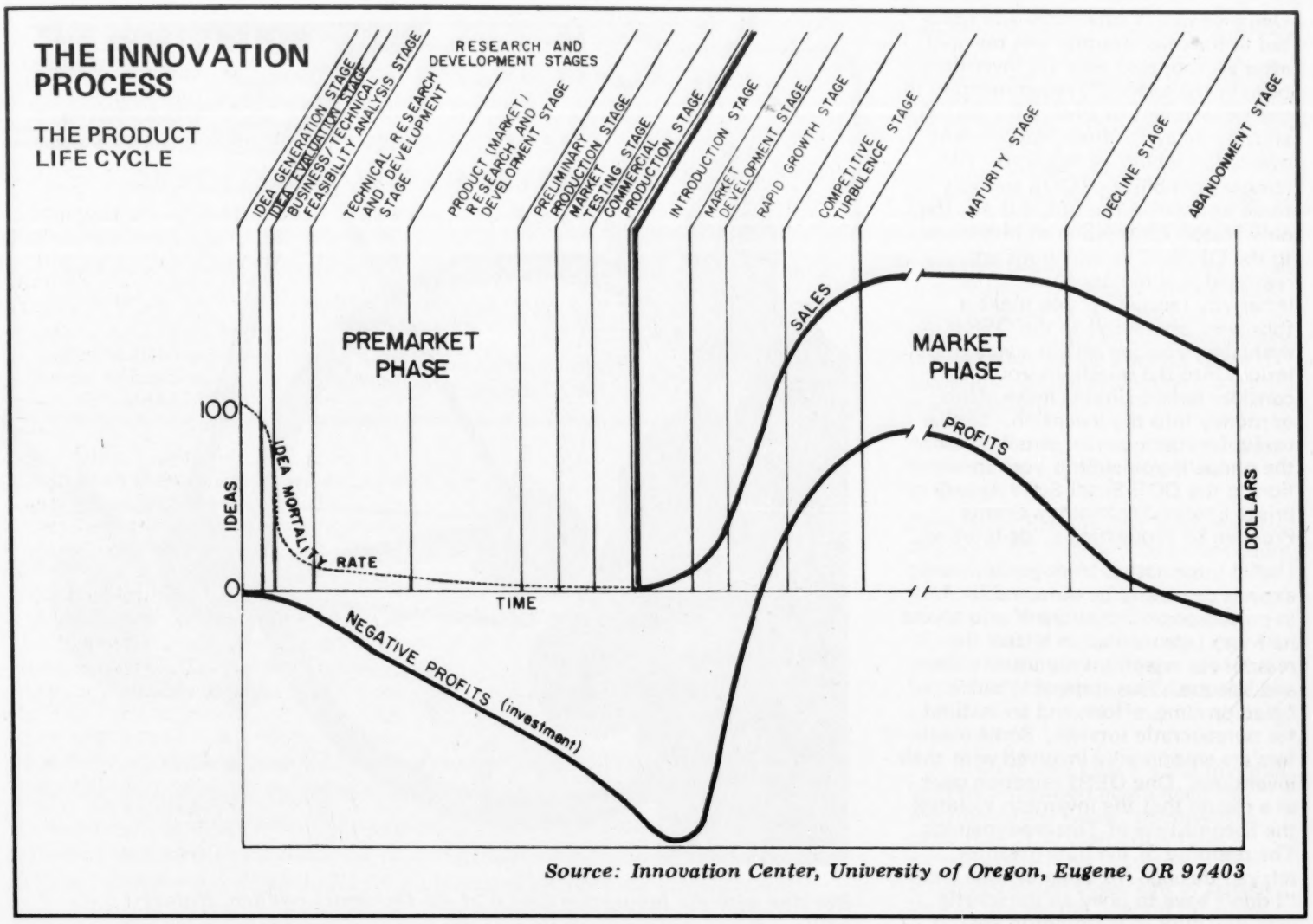
Alan Kalker is a writer, microsculptor, and occasional inventor living in Berkeley, California.

–SB



Source: Innovation Center, University of Oregon, Eugene, OR 97403

and particular method to become apparent to more than one. Industry's interest in the nonproprietary abstract of an unpatented invention may justify the cost of professional aid in negotiating the next phase: a confidential disclosure agreement. Even between corporate giants a complex ritual is required, with several layers of commitment matched with layers of disclosure.

One method of contacting industry is advertising your invention in a computerized technology transfer data bank. Dr. Dvorkovitz lists only market-ready inventions and trade secrets that they think are of interest to industry. They charge the inventor nothing. Industry pays the freight in access fees or commissions. Inventions need not be new; old technology appropriate to developing countries is OK. Technotec will carry any inventor's message, but charges $100 a year minimum rent for memory space that holds a 1,000-character message. For a limited time inventors with solar energy, agriculture, and food processing patents get a one year listing for free.

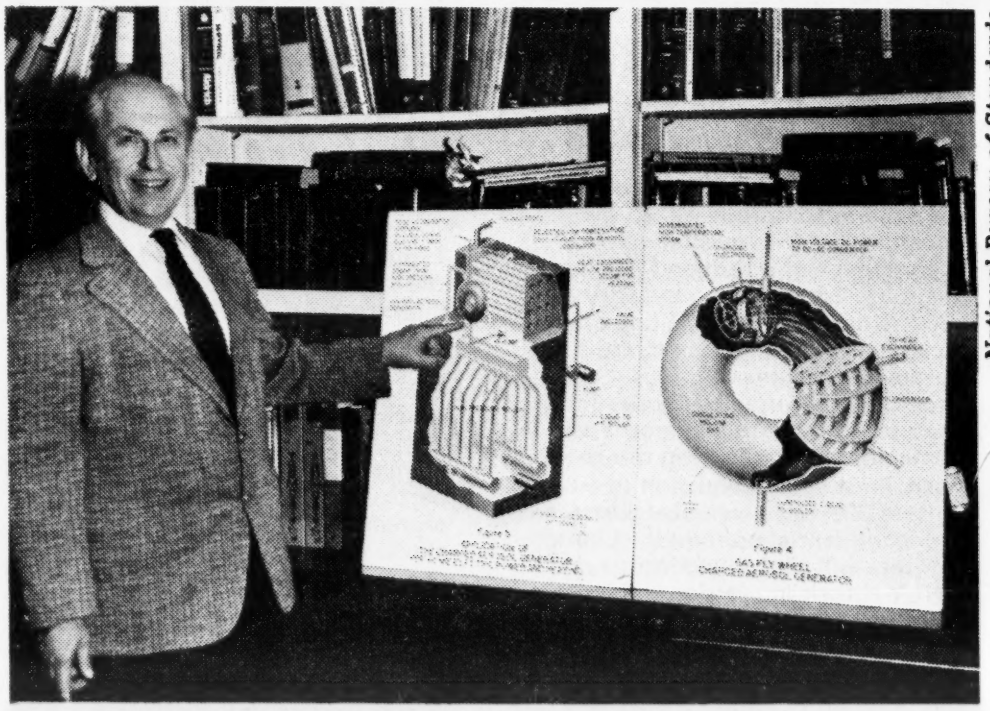
Request forms from:

Dr. Dvorkovitz & Associates
P.O. Box 1748
Ormond Beach, FL 32074

Control Data Technotec
P.O. Box O
Minneapolis, MN 55440

Energy related inventions

If an invention can save energy you can get a free evaluation of its technical and economic feasibility from the government. You need no special format, nor know if it is an invention or trade secret. If clearly marked "confidential," it will be evaluated in secret, protected from disclosure or conflict of interest by contract and criminal sanction. To obtain this free service simply dispatch a complete description of your invention to: Office of Energy-Related Inventions, National Bureau of Standards, Washington, D.C. 20234. They will send you an Evaluation Request form which you sign and return to start the evaluation. Then, you wait. *[more →]*



National Bureau of Standards

An invention developed in cahoots with the Office of Energy-Relation Inventions (OERI – part of the National Bureau of Standards). The device uses charged aerosols to convert thermal energy to electric energy without moving parts. The inventor is Alvin Marks, of Marks Polarized Corporation, New York.

Box 428, Sausalito, CA 94965

One invention I submitted was rejected in 5 weeks, another was rejected after six months. Had my inventions been in the select 2% recommended to the Department of Energy for support, another delay for their independent evaluation would be required. The remote possibility of DOE support some time far in the future is not the only reason for sending an invention to the OERI. The rejections are reasoned in summary form in the letter you receive. If you make a follow-up phone call to the OERI evaluator, you can obtain a wealth of insight into the questions you must consider before sinking more effort or money into the invention. Similar useful feedback can be obtained on the phone if you submit your invention to the DOE Small-Scale Appropriate Energy Technology Grants Program by requesting a "de-briefing."

Useful information from government experts can easily be obtained for free in person or on the phone if you sound half-way reasonable. In letters the reasons for rejections are usually terse and opaque. This state of affairs is based on time, effort, and an instinct for bureaucratic survival. Some inventors are emotionally involved with their inventions. One OERI rejection gave as a reason that the invention violated the Second Law of Thermodynamics. The response of the irate inventor, relayed through his Congressman, was: "I don't have to obey all the idiotic laws you guys in Washington pass."[4]

The major problem with the OERI/DOE program is the time delay. I have found two shortcuts. One is limited geographically, the other by type of invention. Both require preparing 200-word typewritten abstracts of features, advantages, and applications of the invention. One program is open only to those living in Oregon, Washington, Idaho, Northern California, and Nevada. An abstract sent to Energy Related Invention, 131 Gilbert Hall, Univ. of Oregon, Eugene, OR 97403 will, if deemed of high potential, be forwarded by them to OERI on a priority basis for special attention.

The second method is to send an "unsolicited preproposal" to the government office evaluating your specific type of invention.[5] This is the route used often by industry and university researchers. In one case funding was provided six months before OERI approval. This route should only be used by those sure of their technical basis and recent academic literature. To keep this route open, limit your submission to a typewritten 200-word technical abstract (nonconfidential preferred). Limited facilities will probably permit a reply ONLY if their impression is favorable. Please, no phone calls. If you get no response, submit your invention to OERI to get feedback. Do not expect this program to supply a reasoned rejection or explanation.

If you do get a favorable response from any of these, it is usually better to have filed your patent application before accepting government funding.

Working with the Innovation Center at the University of Utah, Robert Williams fabricated the prototype of this automatic transmission for bicycles. Mr. Williams has now formed his own company to pursue commercialization of the device.

University Innovation Centers

The bright new hope for the independent inventor, and possibly the university treasurer. Five years in the making, the innovation center experiment drew favorable reactions at a University of California Santa Cruz conference in November '78. Produced by the U.S. Congress, directed by the National Science Foundation, the experiment stars a bevy of prominent universities.

I found the main advertised plot of the experiment not terribly exciting: ". . . to determine if combining formal classroom training in engineering and business theory and hands-on clinical experience in generating new ideas, developing and evaluating new products, and initiating new ventures can increase the . . . probability of the . . . participants becoming successful entrepreneurs."[6] Even assuming the aim is "good," good for the students and good for the productivity of the nation, the experiment would be just very interesting.

More noteworthy is the way R. Colton and A. Ezra of NSF structured the experiment. Normally the approach would be for the government to fund the courses, evaluate the students after five years, then use the results to determine if continued funding was desirable. Instead, they took as their unstated premise: you cannot do good for long if the process of doing good does not of itself generate sufficient revenues to continue the good work. One source of revenue is the "hands-on clinical experience." Since the students and faculty were to attempt to solve real world business problems, a successful solution could generate real world revenue. It was reasonable for the students and university to be repaid for the value of the services rendered, if the venture was successful, through notes, equity, and royalties. If the service seemed valuable to business and government, they might contract for work to be done. Alumni might wish to support the program. Government funds were only seed money. Each innovation center should try to prove its utility by becoming self-sufficient within the grant period of five years. As new businesses take some time to produce enough revenue to repay notes and provide royalties, and even longer before paying dividends, this is a tough test. Surprisingly one of the innovation centers has already become more than self-sufficient. The center at the Massachusetts Institute of Technology budgeted for fiscal year 1978 over $150,000 in income from royalties and $350,000 in contracts.

Also noteworthy is the underlying attempt at fiscal responsibility. A

An ad from the 1979 San Francisco phone directory.

"The total number of licensing agreements negotiated by RLO (Raymond Lee Organization) from 1968 through April 1976 is eight," reports **Action**, *The Journal of the Association for the Advancement of Invention and Innovation, July-August 1977. "RLO has stated that it has assisted approximately 30,000 inventors, of which three directly involved RLO in transactions in which the clients received, as a result of RLO's service, an amount of money in excess of the fee paid to RLO."*

In a 1975 complaint against RLO by the Federal Trade Commission, Judge Ernest G. Barnes stated: "Respondents' shrewd use of exaggeration, innuendo, ambiguity, half-truths, and omission of material facts has a substantial tendency and capacity to create a misleading impression in the minds of the ordinary purchaser concerning RLO's business and professional qualifications and the nature and value of its services. This misleading impression is heightened by respondents' method of operation in a technical area where little information is readily available to the public."

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continuing part of the project is an attempt to measure new tax monies generated against the tax monies expended to seed the centers. Interim figures are impressive. ". . . in 1977 alone the federal taxes collected as a result of the profits and wages attributed to the new ventures initiated by the Innovation Centers exceeded $2,500,000, approximately four times the annual federal investment of $670,000. . . ."[7] It is hoped the final report takes at least a stab at the most difficult task of separating truly new tax revenues from merely relocated tax revenues.

PENNSYLVANIA: Center for Entrepreneurial Development, Carnegie-Mellon Univ., 4516 Henry St., Pittsburgh, PA 15213. Dr. Dwight Baumann, Director. New company focus, provides a "maternity ward" for new business startups. An inventor/entrepreneur can obtain up to $40,000 worth of engineering and management expertise on a continuing basis against notes and equity in the new company. Assurance of CED management assistance allowed one company to obtain $150,000 startup capital. Substantial assistance has been provided inventors of a microcomputer energy management and security systems, a blood test serum for gonorrhea, a blood oximeter, and a remote control unit for locomotives and cranes. CED has aided community needs by devising a method of providing cheap taxi service and a method of subsistence for out-of-work actors. Local inventor's submissions seem mostly to require market potential evaluation, capital, and an entrepreneur to reduce the idea to practice. They note ". . . the shortage is in technological entrepreneurs rather than in inventors."

Access: Stop by the CED office (phone first). A continuing assistance approach requires that the inventor/entrepreneur reside or relocate nearby.
Comment: Day to day involvement in the operation of a new business is an arduous and controversial role for a university. It holds promise of providing the most realistic education for students and greatest financial rewards for the university.

NATIONAL & OREGON: Innovation Center, College of Business Administration, University of Oregon, Eugene, Oregon 47405. Dr. Gerald Udell, Director. Inventor and new product focus. Attempts to provide a badly needed nationwide business oriented evaluation service to inventors of new products and services. For the neophyte inventor, desperate for impartial advice, it provides for a computerized indication of whether further effort and expense is justified. Evaluation is directed toward the sad plight of the amateur inventor who spends thousands of hours and dollars achieving a product that works well, has full patent protection . . . and no economic viability. About 1% of inventions evaluated are deemed worthy enough to receive center assistance in reaching the marketplace. Distant inventors are referred to SBA's Small Business Institute program which uses college students to aid the inventor. Local inventors may receive marketing aid from the Center. Successfully marketed products seem mostly to fall in the categories of appropriate technology (wood stoves, low fuel consumption vehicles) or cottage industry (etched glass, wood frames). Only invention refused evaluation: a marijuana gin.

Access: Mail request for "Innovation Registration and Disclosure" form to Center.

Comment: For the first time inventor desperate for inexpensive independent guidance by mail this seems the only game around. As with the dog who could play the piano, the amazing thing is that it is done at all. The quality of the performance need not be perfect. The computerized evaluation process is itself under continuing evaluation.

The main qualm I have is the minimal level of protection guaranteed the inventor in the waiver the inventor must sign. The evaluation form requests details on information not protected under copyright or patent laws — test results, market information, and product cost details. Yet the inventor is required to sign a waiver acknowledging: "For protection of my idea, I rely solely upon existing or future copyrights or patents which will be obtained at my sole expense."

On the other hand, the waiver indicates the disclosure will be treated "with care" and the brochure supplied to applicants promises one of the features of the program is "confidentiality, that is, only individuals who have signed nondisclosure agreements will see an idea without written authorization from the inventor."[8]

The problem is that many first time inventors suffer from "inventor's paranoia" and will be dissuaded from using the service by the wording of the waiver they must sign. The waiver form fails to provide for the growing use of trade secrets in fields like electronics. Some in the electronics field note that "black boxing" — sealing components in epoxy or sanding off part numbers, rather than using patents — is their usual method of protection. One government aide observed: ". . . it's pretty commonly known that there's an increasing reliance on trade secrets instead of patents. . . ."[9] A potential licensee of a trade secret might note the terms of the waiver in determining that the scope of possible trade secret protection has been lessened. A court may cite the terms of the brochure in determining that the Center is liable to the inventor for breach of a confidence. As it stands the waiver seems to offer unpleasant consequences for both possible interpretations, but if

currently contemplated changes are satisfactory, it may be of use to even the most prudent inventor.

MASSACHUSETTS (maybe): MIT Innovation Center, Massachusetts Institute of Technology, Room 33-111, Cambridge, MA 02139. Dr. Yao Tzu Li, Director. "Inventing done, on contract, while you wait" might be the slogan of the Center. A majority of current income seems to come from inventing on contract. Industry — need a TV game or precious metal forgery detector? Government — need a method of evaluating and marketing energy efficient inventions? MIT Innovation Center will invent one, provided you supply the necessary funds. Add to this a startling array of student, faculty and outside inventions and you have a more than self-sufficient innovation center. Some of the 1975-76 projects — wide-band electronic guitar, wheel torque feedback controlled front brake, thermally controlled liquid gas, small molecule detector, pulse-width-modulated amplifier and communications link, high efficiency bow, dynamic paper making process, desalination process, bicycle frameset, and an automatic banana peeler. Inventor is given a flat 35% of income from patents or licensing agreements.

Access: In November 1978 the Center director indicated they are currently unable to handle submissions from outside inventors. In the past, and hopefully in the future, an outside invention program provides access.

UTAH: Utah Innovation Center, University of Utah, Merrill Engineering Building, Salt Lake City, Utah 84112. Dr. Wayne S. Brown, Director. Newest NSF center funded in 1977, four years after the others, ". . . to replicate the concept based on the experiences of the originally funded Innovation Centers." First outside inventor project is an infinitely variable bicycle transmission which automatically varies gear ratios to fit road gradients. Has R & D prototype shops with facilities for injection molding, heat treating, etc. Has previous experience in successfully marketing faculty inventions (e.g., portable dialysis machines) by cooperating with industry in latter stages of development to insure rapid commercialization. Has a tradition of faculty entrepreneurship — several faculty members have founded their own businesses located in a nearby university research park.

Access: 200-word typewritten non-proprietary abstract of the invention. Inventor should reside or be willing to relocate nearby so the Center can give assistance on a continuing basis. Possible exception for bio-medical inventions, an area of particular interest to this Center.

Comment: Looks like a winner. Open enthusiasm of the staff of this Center at the Santa Cruz conference impressed me. Indicates that a public university faculty can openly be involved in commerce without public outcry or befouling its reputation. Indicates a public university that allows faculty entrepreneurship can attract and hold exceptionally qualified faculty even though they cannot match salary offers of private universities or industry.

Jerry Bybee

Two seniors at the University of Utah (John DeJong and Douglas Kihm) worked with its Innovation Center in their patent and feasibility study of their microcircuit-controlled programmable breadboard device.

OTHER: Many other universities in the U.S. and Canada have or are planning innovation center activities. If you live near a university check the business administration and engineering school catalogs — 138 schools now offer entrepreneurship or small business courses. Many of these courses ask students to solve real life new business problems; the professor for the course may allow them to attempt to solve yours. Some faculty of public universities covertly aid budding inventors. Try to find someone teaching a course in your area of interest. Likely sources of information — the dean's secretary, university patent attorney, and professors of aeronautical engineering.

Aid from public university faculty has been covert or ad hoc because they fear criticism from the taxpayers for using public facilities for private gain. The fear of this criticism is commonly expressed by university and government officials. At the Santa Cruz conference innovation center staff members agreed the feared criticism never came from taxpayers. Indeed, one endowment officer remembered that when he mentioned the innovation center to an alumnus he received a substantial contribution, the alumnus commenting, "That's the first thing I've seen the university do for the small businessman." In reality, the expertise of the university can be said to have always been available to big business, whose needs are frequently reflected in government grants made available to universities for research. Big business can afford to hire faculty as consultants. Even though the independent inventor and small business person cannot afford to pay for university expertise in advance, taxpayers should be satisfied if the university is more than fully recompensed out of profits realized.

Out of pocket expense for the university is small. The requisite expertise and laboratories are already "purchased" for another purpose, teaching. One of the big problems of the innovation centers has been faculty resistance to sharing their expertise with the center for what they feel is an unprofessional activity. Ironically, some of the same faculty members feel no such qualms when they share their expertise with an outside company as a paid consultant. Sharing expertise with independent inventors for the eventual financial benefit of the university may seem less unprofessional if viewed as a means of survival for universities.

The demographic, taxpayer, stock-market and inflationary squeeze on the university is fierce. A source of funds to continue the "good" work of education other than the public purse should be welcomed. The NSF experiment indicates that at least some universities can benefit. One conference participant, noting the poor stock market performance of the schools endowment, was considering suggesting that the trustees invest some of the school's endowment in innovation center activities. He felt the combined expertise of the business and engineering faculty could pick a winner as accurately as a venture capital company. Venture capital

returns when they pick a winner are huge — 30% compounded a year on invested capital. If he convinces the trustees we may see proof or disproof of the old adage that "people who can't make a living at something end up teaching it."

Less venturesome university officials may wish to participate in the drafting of legislation to provide funds to seed new innovation centers by contacting Professor Wayne S. Brown at the University of Utah.

Advertised idea brokers

Market demand for university innovation centers is indicated by the unworthy success of a group of charming charlatans, the widely advertised idea brokers. They take in some $100 million each year from some 100,000 hopeful inventors,[10] providing a great deal of ego gratification and an occasional handsome patent certificate suitable for framing. Those who expect to receive more for their fees are usually disappointed. One firm seems to have "assisted" some 30,000 aspiring inventors. Only three of these received income greater than the fees paid.[11] Another, the SEC charged, received some $4 million in fees from some 4,000 inventors. None received income greater than the fees paid.[12]

Remember, a patent is no guarantee of economic viability. It can cost as much to search and patent an invention that is viable as one that is not. Patent protection can vary from broad protection to extremely narrow. At the bottom is the design patent. This can almost always be obtained, but protects you from a product whose appearance is almost identical to yours.

Reputable Invention Managers

Not all invention managers are charlatans. Some have a proven record of returning more than they take. Two available to the independent inventor are Battelle Development Co. (BDC) and Arthur D. Little, Inc. (ADL). As the two giants in this backwater of industry who are quite similar in some respects, they offer a provocative contrast of business styles and results of interest to business theologians.

Unlike the charlatans, neither advertises or charges the inventor a fee. Evaluation, patents, development, and marketing costs the inventor nothing unless the invention is successfully marketed. If it is, they get a portion of royalties received. Both invention management groups were formed originally to market the inventions of employees of a large company providing independent science and engineering consulting services to governments and industry worldwide. Inventions of outside inventors usually are considered only if the invention manager's expertise will help make the invention market ready for license to unaffiliated manufacturers, though both recently have added a very limited venture capital capacity.

Though little known to the general public, the parent consulting companies are prominent in their field, and hardly small potatoes. Together, in 1976, they had more employees and revenue than the brokerage firm of Dean Witter, Inc. Battelle's four facilities had reimbursable costs and fees earned of $185 million, 6,000 employees, and technology licensing revenues of $656,000.[13] Arthur D. Little had gross sales of $86 million, 2,000 employees, and technology licensing revenues of $2 million.[14] (Rough 1976 data.)

Both companies have broad technical expertise of the highest caliber, and could handle almost any conceivable invention. They differ in their likes and dislikes, but both can be said to have very high standards. They want only substantial improvements, not mere minor modifications of existing devices. ADL puts it this way: "The submitted invention should stimulate the enthusiasm of the staff. . . . Since ADL's staff members deal largely with advanced technology, it is not probable — although it is possible — that they would be interested in such items as household devices, automobile accessories, toys, games, and wearing apparel." Both companies have considerable expertise and interest in alternative energy, especially solar. Areas of invention disliked by BDC — liquor or tobacco industry, nuclear, large-scale chemical or heavy industry, auto engines or original equipment, games, sporting goods, weapons, building systems, products requiring governmental action before acceptance by industry.

The packets sent by each company to an aspiring outside inventor have one common element. Neither, initially at least, wants a confidential relationship (as between attorney and client) with the inventor. Such a relationship might require the company to avoid all possible conflict of interest by turning down future paid research contracts in the area of the submitted invention even though they had decided not to develop it with their own funds. It might also require the company to reveal past or present independent or sponsored similar research. Fair enough.

The packets do seem to differ in their initial submission requirements.

BDC: Duty of care: ". . . no obligation, either expressed or implied. . . .. $1,000 . . . shall be the maximum damages for any and all liability of BDC with respect to such information or unpatented idea, including, but not limited to, BDC's disclosure thereof." Waiver form: full page of legalese. Submission: full and complete details. Time for evaluation: 6 to 10 months (if rejected on initial screening: two weeks).

ADL: Duty of care: ". . . exercises due care to prevent submitted material from being communicated to others outside of the company and treats such material in accordance with [its] established professional standards." No dollar limitation of liability. Waiver form: four simple lines. Submission: brief description. Time for evaluation: three weeks (may then request confidential information).

Comment: Just because BDC might not seem obligated to treat an unsolicited idea with much more care than an unsolicited bag of excrement does not mean they might even consider doing so. What we have here is a difference of business style. BDC's waiver is written in normal big business style —protect the company and let the inventor take care of herself. ADL uses the nice style — protect the company and the inventor. BDC's waiver has about the same one-sided approach used in waivers required for many industrial submissions, but when coupled with the request for full and complete details it can put the inventor in an unfair predicament. The problem here is similar to the problem discussed above in the section about the Oregon Innovation Center waiver. Here, however, the problem is worse since BDC's form is more unequivocal. A potential licensee of a trade secret might feel the terms of BDC's waiver lessens the scope of possible trade secret protection. A very prudent inventor who has not sought professional advice probably will use the procedure outlined in the "industry submissions" section for both firms.

The packets sent the outside inventor seem to differ also in the terms of the "typical" agreement offered the inventor.

BDC: Depending on stage of development, 30% to 60% of "net" income (license fees minus administrative, development, licensing, and all other BDC expenses) to inventor. Inventor grants all rights and title to patent to BDC. BDC is obliged to return patent if it fails to use reasonable diligence to negotiate licenses and promote commercial use. If returned, and BDC's R & D and patent expenses exceed $1,000, inventor pays 30% of future net income until BDC gets double its expenses.

ADL: Royalties usually split 50/50. Inventor grants one year exclusive right to license. If ADL fails to find licensee within year, all patent rights and applications, models and data produced given without obligation or cost to inventor.[15]

Comment: BDC seems obliged to a reasonably diligent effort, ADL to a specific result by a specific date. In my experience in dealing with big business (not BDC or ADL) this distinction, not dishonesty, is the real problem. Exclusive rights to an invention should either be paid for (even while being evaluated) or have a specific deadline. The problem is one of priorities. I have received many good honest reasons for delayed decisions or actions — "Joe was called out of town, next week for sure," or "We just got a new section leader, it is right on the top of the pile." Each time I felt the speaker honestly intended to do what was promised, but something with a higher priority came up. In every big business there are many important projects

competing for limited time and funds. Unless delay costs the company money, or there is an external deadline, even with the best corporate intentions your invention may not be commercialized.

ADL's 'nice' approach insures the inventor can look elsewhere if, for whatever good reason, results are not obtained by a certain date. Generally this approach can aid rapid commercialization by giving the invention management officer a justification for insisting that corporate management provide requisite funds this month rather than next. BDC uses the normal big business style: make a reasonable offer that protects the company and let the inventor bargain for the terms she feels necessary to protect herself. Some people love big business bargaining; I don't. Sometimes it's just silly: the need for terms that protect both parties is obvious from the start. Then, any accompanying hassle, aggravation, and mutual suspicion is needless. The normal big business style is common, despite the aggravation, because it is thought more businesslike, paying dividends on the balance sheet. Nice guys finish last . . . or do they?

It is probably misleading to compare the technology licensing revenues of these two companies. No doubt it is probably a reflection of much more than business style. On the basis of clearly inadequate information I can prove or imply nothing. Still, I find it interesting (and only interesting) to compare the results adjusted by number of employees. Since technology licensing revenues include both employee and outside inventions, this seems a possible basis for comparison. Adjusted for number of employees, ADL beat BDC by about 2 to 1 in 1975, about 7 to 1 in '76, and about 7 to 1 in '77.[16]

Perhaps ADL's use of the nice business style may signal a trend. A substantial portion of ADL's income comes from providing business management consulting services. Each year big business pays them millions for advice on how to become more profitable. Free advice for big business from ADL vice president Walter Cairns: ". . . Some companies behave as though hard-nosed bargaining is essential in doing business with technology sources, even though such an attitude may result in lost opportunities, poor relations with the party from whom technology has been acquired, and a reputation for being tough to deal with. While the management of a company must naturally protect the interests of its stockholders and employees . . . remember that adherence to fairness . . . may frequently produce unexpected dividends in the continuing development of improvements by the technology source, as well as disclosures of other opportunities the source may develop in the future."[17]

Access: request invention submission forms from: Battelle Development Co., 505 King Avenue, Columbus, Ohio 43201 and Arthur D. Little Enterprises, 20 Acorn Park, Cambridge, MA 02140. ■

REFERENCES

1. Univ. of State of N.Y., Albany; Georgia Tech, Atlanta; Boston Public Library [PL]; Buffalo & Erie County PL; Chicago PL; Cincinnatti PL; Cleveland PL; Ohio State Univ., Columbus; Detroit PL; Linda Hall Library, Kansas City, MO; Los Angeles PL; State Historical Society of Wisconsin, Madison; Milwaukee PL; Newark, NJ PL; New York PL; Franklin Institute, Philadelphia; Carnegie Library, Pittsburgh; Providence PL; St. Louis PL; Oklahoma A & M College, Stillwater; Sunnyvale PL, CA; Toledo PL.

2. Brosnahan, ed., *Attorney's Guide to Trade Secrets*, 1971.

3. Hawkins, *Corporate Policy and Unsolicited New Product Ideas*, 1976, 15.

4. Paraphrase of anecdote related by Jacob Rabinow, unofficial NBS raconteur.

5. Propose research evaluating your invention. Energy efficient (e.g., solar) inventions ONLY. Crop drying: W.R. Fox, Mississippi State Univ., Mississippi St., MS 39762. Livestock production: J.P. Mason, Jr., Virginia Polytechnic, Blacksburg, VA 24061. Greenhouses & rural residences: L.D. Albright, Riley-Robb Hall, Cornell Univ., Ithaca, NY 14853. Windows & Lighting: S. Selkowitz, Bldg. 90, Rm. 3111, LBL, UC, Berkeley, CA 94720. For others, contact the Department of Energy, Unsolicited Research Proposal Branch, Procurement & Contracts Management Directorate, Washington, D.C. 20545; or try phoning a government scientist with published work similar to yours.

6. Colton, "Technological Innovation Through Entrepreneurship," *Engineering Education*, Nov. 1978, 193.

7. Ibid., 194.

8. Udell & Baker, *Exploring New Ideas*, 1978, 5.

9. Aide to head of President's innovation study due April 1979 quoted in: Shapley, "Electronics Industry Takes to 'Potting' Its Products for Market," *Science, 202*, 849 (1978).

10. Udell quoted in: "For the Independent inventor, Assistance or Abuse," (panel), 1976 *Bul. Am. Patent L. Assoc. 109*, 110.

11. *J. Assoc. for Advancement of Invention & Innovation*, 82 (1977).

12. Ibid., 84.

13. Battelle Memorial Institute [BMI], President's Report and Annual Review, 1976, 20, 25, 28. For Consolidated Balance Sheet purposes accountants deduct from the category "reimbursable costs and fees earned" $57 million (costs directly reimbursed by ERDA) and $23 million (costs and fees earned by Battelle-Institute, accounts examined by other auditors). BMI, 1976, 23, 27, 28.

14. "O-P-S Survey," *Invention Management*, Oct. 1977.

15. ADL sometimes requires some cost reimbursement before split, e.g., if extraordinary out-of-pocket expenses are anticipated.

16. "Technology licensing revenues" does not include all intellectual property income, e.g., income from sales of intellectual property. Battelle: employees, 6000 in '75, 6100 in '76, 6300 in '77; technology licensing revenues, $2,099,000 in '75, $656,000 in '76, $707,000 in '77. Fn. 13, BMI, 1977, 18, 25, 28. ADL: employees, 1800 in '75, 2000 in '76 and '77; technology licensing revenues, $1.5 to $2 million in '75, '76, and '77. Unpublished source.

17. "Product Opportunities: Fact and Fable," Industry, Assoc. Industries of Massachusetts, April, 1978.

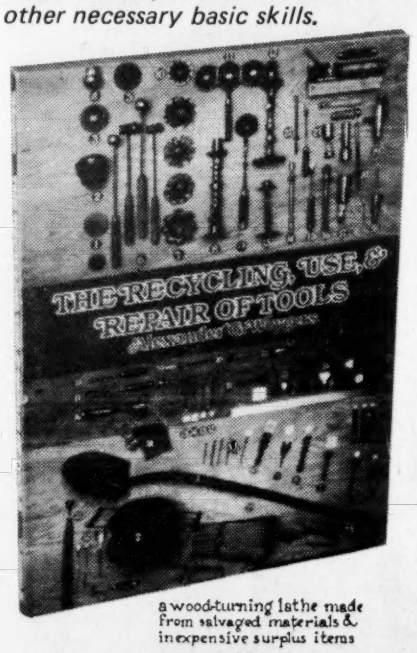
Jerry Bybee

Arthur D. Little, Inc., Cambridge, MA. The nice guys.

The Recycling, Use, & Repair of Tools

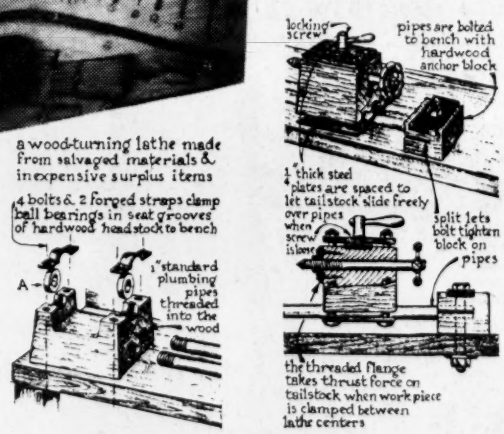
Alexander Weygers, blacksmith/artist extraordinaire, visits us again with his third book. It is every bit as good as his first two, **The Making of Tools** *and* **The Modern Blacksmith** *(Whole Earth Epilog, p. 548), and continues the patient, beautifully illustrated self-teaching that made the earlier books so very fine. If you are an experienced smith, the new book will probably have some things you don't know; it speaks extensively of recycling old metalworking machines such as lathes and even a trip-hammer. There is a nifty chapter on making bearings, and another on making a good wood lathe from scrap metal. The index shows a diversity stemming from his almost unbelievably varied experience. Mr. Weygers is a good man to know.*

Inexperienced and would-be smiths should start with his earlier books, as this one doesn't cover tempering and other necessary basic skills.



—J. Baldwin

The Recycling, Use, & Repair of Tools
Alexander G. Weygers
1978; 112 pp.
$6.95 postpaid
from:
Van Nostrand Reinhold Co.
Order Dept.
7625 Empire Dr.
Florence, KY 41042
or Whole Earth



The Timber Frame Planning Book

The same folks that brought us **The Timber Framing Book** *(CQ, Fall '77, p. 85) have done it again with this book of actual plans for post-and-beam houses and barns. The plans include a rather complete cutting schedule with all parts detailed in commendably clear sketches. The designs are traditional and are inspired by actual buildings, many of which are hundreds of years old. My only quibble would be that since the old designs assumed an endless forest of nearby trees for heat, it might be more appropriate to attempt a more modern energy-saving design using this structural system. In any case, timber frame construction has a good potential for energy and materials saving, and offers that irresistible bonus, The Raising, which tends to make good neighbors.*

Both of these books are usually good and complete. This one, for instance includes a table of allowable spans for timbers of various sizes and drying time for fresh cut wood. The plans are also available as sets of blueprints. If timber framing tempts you this is a good place to start your homework. Timber framing can meet code.

—J. Baldwin

The Timber Frame Planning Book
Stewart Elliott
1978; 358 pp.
$15.00 postpaid
from:
Housesmiths Publishing
209 Canyond Blvd.
Boulder, CO 80302
or Whole Earth

Two Chainsaw Mills

We've shown a number of chainsaw mills over the years (they make boards out of logs, using your chainsaw), but the inventors keep working to reduce the shortcomings and limitations. Here's two more. George's are very simple in the tradition of 1930 farm machinery. His smallest machine is remarkably inexpensive and is reputed to be exceptionally easy to adjust (something that many others can't claim). George seems to be a character; his catalog includes bumper stickers that proclaim "The 12-inch Wonder Does It Again." He also sells a mill that can handle cutting large burls and slabs. [Suggested by Dan Gribi.]

The other is a fancy rail mounted job that is neither cheap nor simple, but eliminates the problems other machines have getting that critical first cut straight. This machine is very well built and intended for serious production. (Don't bother them if you're just curious, please.) Though I've not actually seen one, it would appear to be the state of the art. It can cut tapered siding! [Suggested by Stephen Anderson.]

—J. Baldwin

George's Chainsaw Mills
Catalog
from:
George's Wood Works
14135 Olde Highway 80
El Cajon, CA 92021

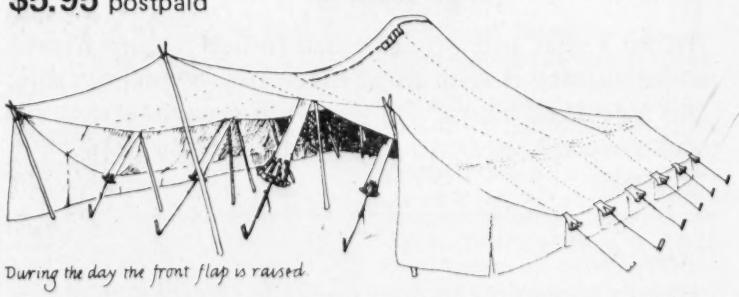
Nordic Prince
Catalog
from:
Nordic Prince
P.O. 189
LaGrande, OR 97850

Tents: Architecture of the Nomads

Passive solar architecture, with its predilection towards large heat storing masses has deflected interest from another possibility: no thermal mass. This book reminds us that much of the world's indigenous architecture consists of tents, yurts, and other portable lightweight lodges. A very wide array is presented here, along with a rather simple-minded text explaining details and history. The sketches are, regrettably, not very good, and there are no photographs at all. Too bad, because many of the little details are thus obscured. These shortcomings are annoying, but the book still serves as a useful and perhaps even inspiring compendium of tent and tent-like structures.

—J. Baldwin

Tents
(Architecture of the Nomads)
Torvald Faegre
1979; 167 pp.
$5.95 postpaid
from:
Anchor Books
Doubleday & Co., Inc.
501 Franklin Ave.
Garden City, L.I.,
NY 11530
or Whole Earth


During the day the front flap is raised

The primary purposes of the black tent are: 1) to provide shade from the sun, 2) to protect from cold, wind, sand, and dust, and 3) to provide privacy for the occupants. The black color of the tent is functional: a black cover gives more shade. And while black absorbs more heat, the loose weave lets the heat disperse so that the interior may be twenty to thirty degrees cooler than the outside. Travelers in desert country have found that their canvas tents were considerably hotter than the black tent.

The I Cash Clothes Man

BY MITCHELL ZUCKER

THE I CASH CLOTHES MAN carried a newspaper neatly folded around old clothing; this was the badge of his profession, as was his voice calling:

I Cash Clothes
I Cash Clothes . . .

only it was more like:

Ayiiii! Kesh-klozz
Ayiiii! Kesh-klozz. . . .

He was an immigrant tailor, newly arrived in New York City and begging without begging. People would give him worn clothing, but it was important to him that he was not begging; he was prepared to pay cash for clothes, or at least make a cash offer, to be paid at a later date.

He took the give-aways to his home, a tiny cell in the basement of a tenement, and deftly repaired them by hand; he then sold them to second hand stores run by charitable organizations; he then resumed his rounds of accumulation and repairing.

After a year he was able to afford a cheap portable sewing machine, and with this he subcontracted collars to a manufacturer of army shirts, and continued repairing old clothes. He soon purchased a high speed industrial model and sub-contracted to sew zippers on army sleeping bags, and epaulets on dress jackets, while also designing comfortable house dresses.

Within a year and a half he had rented a store front and equipped it with three machines, a cutting table, and a pressing stand. He was soon rewarded with his own government contract to manufacture navy 'P' coats.

Dear CQ,

Kindly publish the enclosed stories and illustrations so I can launch my career as a writer/illustrator and ultimately quit my job as janitor of the Sea Gull restaurant in Mendocino, California, which I have held for the past 7 years, and now find fatiguing while pursuing my passion for writing and illustrating children's books.

—Mitchell Zucker

This contract would finally provide the I Cash Clothes Man with security he never had; it would give him the space he wanted to fill with a family; it would set him free to let his creativity flower; it would make him a success — but he refused to sign because the only day he could sign was the Sabbath, when no contracts are to be signed by human beings; a day of rest.

The I Cash Clothes Man had not been a particularly religious man — until that moment he phoned the contracting officer and told him he could not meet with him on the Sabbath. The officer did not appreciate his religiosity; there was a war on and the navy needed 'P' coats. He would be in New York City on the Sabbath and no other day — take it or leave it!

The I Cash Clothes Man remained poor but religious. His accomplishments appear, on the surface, to be minor. Even his act of refusing the contract was not the act of a holy man. Later in life he admitted he was crazy when he refused the contract:

"I was temporarily made mad by God – so what else could I do – sue God?"

Following this incident he became what some might call a bit deranged. He declared to himself and anyone who would listen that all the wars and all the needless suffering in the world resulted from tight clothing. He developed a tailor's philosophy at a time when people were more interested in the philosophies of athletes, movie stars, and atomic scientists.

He eventually founded a small mens and ladies leisurewear company. It was never successful and it never failed. He employed 15 people, all poor immigrants from his homeland, and they turned out the kind of garments people never threw away – well-made cottonwear, designed for comfort, with tight seams and generous allowances. He sold to stores in his area and never priced his clothing high enough to make a real profit. He was a poor business man with a superb product.

TO UNDERSTAND THE TYPE OF CLOTHING manufactured by the I Cash Clothes Man you must think for a moment of your most comfortable piece of clothing, the one that makes you feel most like you. If this garment was manufactured in a factory, you can assume it evolved from an original I cash Clothes Man. He was the creator of modern comfortable clothing. All the bundles he received while walking the streets were peoples' most comfortable clothing, worn to the point where they had to be discarded – he absorbed the very essence of comfortable clothing.

If, on the other hand, you made your own most comfortable piece of clothing, you can really begin to understand the great debt owed the I Cash Clothes Man, in terms of simple design, full cut easy to sew patterns, near perfect fit, and sensibly recommended fabric.

He was the man responsible for introducing the idea that comfort *is* good style. We now take this for granted, but, in fact, prior to the I Cash Clothes Man style was dominant over comfort; comfort was always present, but always secondary. This simple change in our culture was the life work of the I Cash Clothes Man who felt that to be dressed uncomfortably was a great sin against God.

When he retired and left the factory to the employees, they referred to him as a saint and 'God's Own Tailor.' At the retirement party he gave the following brief speech: "My friends, whatever you do you should always make a profit."

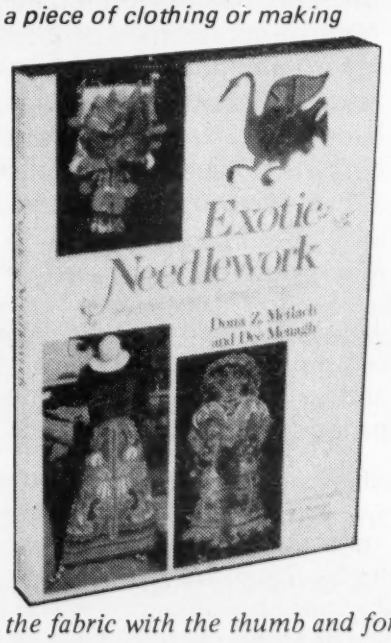
He sewed his last stitch at the age of 78. ■

Exotic Needlework

Dona Meilach and Dee Menagh's book is a visual treat and a fine design source. It includes instructions hard to find in other books such as how to attach shi sha mirrors (tiny round mirrors often found on Indian clothing) to fabric and how to do Seminole patchwork. It would be a nice book to pick up before embellishing a piece of clothing or making a Halloween costume.

–Marilyn Green

Exotic Needlework
(with Ethnic Patterns, Techniques, Inspirations)
Dona Z. Meilach and Dee Menagh
1978; 280 pp.
$9.95 postpaid
from:
Crown Publishers
One Park Ave.
New York, NY 10016
or Whole Earth



Hold the mirror on the fabric with the thumb and forefinger of one hand;

1. Stitch with the other hand and secure the mirror to the cloth with two vertical threads quite close together.

2. Take two horizontal threads and "weave" them under and over the vertical threads.

3. Bring your needle up at A. Place it under the intersecting spokes at B. Bring the needle through the fabric at C with the thread under the needle point.

4. Continue placing the threads under the spokes and space the inserted stitches evenly around the circumference of the mirror. The spokes will pull, so it is necessary to work carefully to result in a neat center.

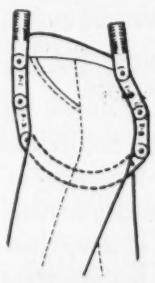
5. The shi sha mirror attached.

The Sewing Corner

The twice-yearly catalogs from the Sewing Corner in Lake Park, Florida are worth a look. The company publishes two separate editions. One is full of hundreds of wonderful thimbles. Ranging from "earthly character" thimbles carved by Parson Hayes, "noted American wood sculptor" to a set of "Austrian Finger Huts." The catalog also includes a chart on how to determine your personal thimble size. Catalog number 2 offers every Gee Jaw a seamstress might desire. Catalogs are free and they even gift wrap.

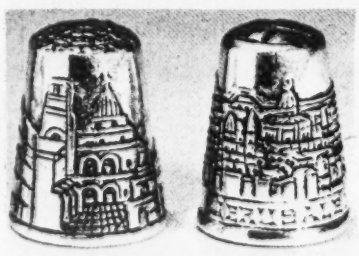
–Marilyn Green

The Sewing Corner
Catalog
$1.00 postpaid
from:
1313 South Killian
Lake Park, FL 33403



FANTASTIC FIT®
Pants Former—A flexible, hinged ruler to help fit any pants pattern to your body contour, from front to back through crotch. Easy How-To instructions included. **9896: $2.95**

"Big Eye" Needle—
Hand-sewing, embroidery, crewel, Rya knots, tie quilting – you name it – is done easily and quickly with our new **BIG EYE – EASY THREADING NEEDLE.** Just tug it slightly, thread or yarn is locked or unlocked; eye closes automatically when needle is pulled through fabric. Truly a blessing for anyone who loves to sew but dreads threading. Goldplated nickel. Comes with how-to-use instructions.
9810: 79¢; 2 for only $1.50



Sacred Shrines — of Jerusalem emblazoned in high relief — Wailing Wall (Judaism), Holy Sepulchre Church (Christianity), Dome of Rock (Islam) — with Holy Land Flower atop. Handcast solid Sterling. From Holy Land. 3376: $20.00.

Holy City — revered panorama of Jerusalem in sculptured high relief, encircles solid Sterling Silver Thimble, topped by Peace Sign. Handcrafted in Jerusalem. 3377: $20.00.

How to Finance a Home (or anything) Without Job, Capital, Bank, or Crime

Use your real worth. Your friends and your word.

BY BAU GRAVES

WHEN MY CAT AND I DECIDED, after our twelfth move in nine years, that we'd better get ourselves a more permanent place to live, I visited the bank. I told the man at the bank that since I wanted to own my home but had no money I would like to borrow $5,000 from him. He asked me some questions about myself and my income, which is rather sporadic. I run a small music store part of the time, but the bulk of my income comes from working one day per week at a publishing firm, which nets me very little, and playing for occasional dances or concerts, which nets me even less. Eventually he told me that he was sorry but; a) the bank didn't believe that a habitable home could be built for $5,000; b) no bank in its right mind would consider lending ANYTHING to a person like myself with a small and uneven income and no credit; and c) why didn't I just work hard for a few years and try to make lots of money, then come back and see him.

I next visited the Farmer's Home Association, an organization ostensibly established to provide mortgage loans to low income rural people who could not get them through regular banks. The man there told me that their MINIMUM income requirement is more than twice the $2,600 which I'd made in 1977. He further stated that there was "no way" I would ever be able to secure a mortgage from ANY established source without doubling or trebling my income.

Realizing that I was a terminal case as far as traditional money sources were concerned, I got to wondering whether I could raise enough money to build a house by borrowing ten bucks from everybody I knew. In China it was once traditional for all of the hundreds of relatives of a new couple to pitch in a little money which amounted to enough to build them a home (probably still works that way in some culture, somewhere). Why wouldn't it be possible for MY extended family of friends and acquaintances to provide my mortgage?

With that in mind, last August I wrote a letter detailing my sources of livelihood and my experience with the banking world. I pointed out that I was living a very low-key, non-consumption oriented lifestyle and was being penalized as a result of what I considered to be responsible and patriotic behavior. I then asked for a loan, saying:

If you will loan me $10 now, I promise to pay you back $11 sometime within the next ten years. In addition you will be invited to the very best house-warming party in Maine's history! I promise to pay all my loaners back, a few each month (just like paying rent!) in the order in which I receive the contributions. If, for some reason, I fail to raise sufficient funds, I promise to repay all loaners within one year.

I sent copies of the letter to everyone I could think of who knew me or anything about me. I distributed them to customers in my store and passed them out at meetings of the Brunswick Folk Club which I organize. I feared that my project would fail and nearly gave it up when my parents refused me permission to send it to ANY of my relatives or their friends, thus cutting me off from hundreds of potential donors. It seems they assumed that their friends and kin would believe they had refused to lend me the money, which would embarrass them. However, by this time money was already pouring in (in the stamped, self-addressed envelopes I had enclosed), so I thought I'd see how much would accumulate.

This was the most interesting part of the project. All of a sudden there was a financial "issue" between me and virtually everyone I knew. People reacted to my proposal in some strange and varied ways.

Many people applauded my audacity and were pleased and proud to contribute. I received many notes like "Far out for you! I hope everything works out!" or, "Your idea is great. We are always willing to help friends who have no use for welfare and/or mortgage people." There was one which read: "Good luck Bau! Here's $10 from me and $10 from my mother who also thought your idea was great!" I received several donations from complete strangers who happened to read my letter: "I don't know you at all, but picked up your letter at the Chocolate Church (Performing Arts Center at Bath). Best of luck in your endeavour. Enclosed find loan of $10." Many of my donors asked that I not bother with repayment: "Enclosed is some money for your 'build your own house fund.' Consider it a gift. Some day you can buy me a beer and we'll be even."

Sarah Hartigan

Bau Graves at the backdoor of his home-made home-financed home. Look at the speed of events in this ingenious, heart-warming episode. The appeal went out August 5, 1978. On September 25 construction began. On November 22 Graves moved into his new house. He footnotes, "My friend on whose land I built my house read this piece and commented that he thought I should have said more about the pleasant community feelings that were generated by my project – the fact that many people felt a sense of participation in my house and my life."

Typesetter Evelyn refers to this article as "The Chutzpa House."

Not all of the response was positive, however. Several friends expressed anger (not to me, usually – but things get around) that I should ask THEM for house money when they had been saving for a home for years. The fact that I had asked for money DID put a certain amount of tension into my relationships with a few people who didn't want to contribute but probably felt like I might hold it against them or something. A couple of reluctant contributors cared enough to comment: "I've been debating about whether to send this or not," wrote one, "not because I don't trust you, but because it raised some issues in my mind about feeling that if I had somehow managed to get money together in my life then I was rather a sucker . . ." Another wrote: "My mental response to your letter was, 1) Huh! Get a job yourself; 2) Look for/create a land trust; and 3) Your marriage dissolved, now you want the world to take care of you. . . ." Two other people wrote refusing to contribute, I received one empty envelope (no return address), and was asked by three people to buy into a chain letter instead.

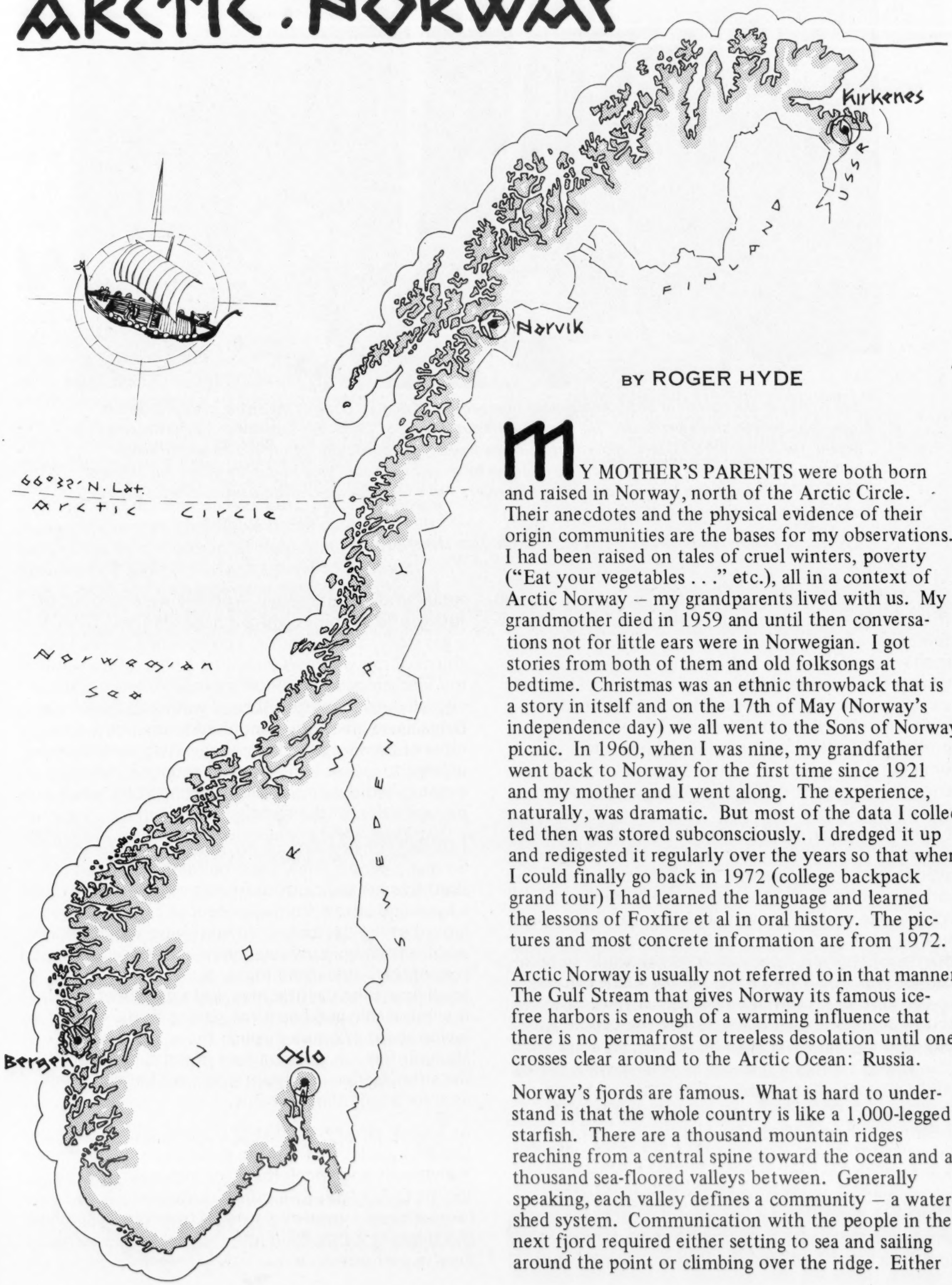
All in all, I distributed about 500 letters. I raised a little over $3,900 which was contributed by 131 individuals, many of whom voluntarily gave more than the $10 I requested. In the process of collecting money, however, another fringe benefit of my fund raising method became obvious. People have ALL KINDS of things just laying around waiting for someone to use them. By tipping off hundreds of people to the fact that I was building a house I saved enormous amounts of money – people were anxious to just get rid of things which I needed. I was GIVEN a gas stove, a refrigerator, a composting toilet, two-thirds of my windows including a big picture window, my kitchen counter, all of my interior wiring, and virtually all of my furniture. I was let in on terrific bargains on all of the wood used in the house and most of the shingles. Best of all – two close friends offered to let me build on their property, which I eventually did with a lease arrangement by which I pay a portion of their annual taxes.

I started construction of my house on September 25. So many people knew I was building that I had constant free assistance from friends who wanted to lend a hand and advice from experienced carpenters. I moved in the day before Thanksgiving and have been warm and snug in my own home ever since. The total cost of the house came to less than $3,400. It is a small house, just a little over 400 square feet, but it is comfortable and beautiful, sitting on the edge of a ravine about 1/2 mile through the woods from Maquoit Bay. A civil engineer friend calculated all the stress factors and beam sizes, so I know it'll be here for a long time to come.

As I work through my list of contributors, paying a few back each month, it is a pleasure to think of them individually and thank them for making it possible for me to have my own home. I imagine it's nice for them too – receiving a check from out of the blue and thinking on the wonderful service of friendship they've performed. ■

Box 428, Sausalito, CA 94965

GOING : UNDERGROUND : IN : ARCTIC : NORWAY



map by Donald Ryan

BY ROGER HYDE

MY MOTHER'S PARENTS were both born and raised in Norway, north of the Arctic Circle. Their anecdotes and the physical evidence of their origin communities are the bases for my observations. I had been raised on tales of cruel winters, poverty ("Eat your vegetables . . ." etc.), all in a context of Arctic Norway -- my grandparents lived with us. My grandmother died in 1959 and until then conversations not for little ears were in Norwegian. I got stories from both of them and old folksongs at bedtime. Christmas was an ethnic throwback that is a story in itself and on the 17th of May (Norway's independence day) we all went to the Sons of Norway picnic. In 1960, when I was nine, my grandfather went back to Norway for the first time since 1921 and my mother and I went along. The experience, naturally, was dramatic. But most of the data I collected then was stored subconsciously. I dredged it up and redigested it regularly over the years so that when I could finally go back in 1972 (college backpack grand tour) I had learned the language and learned the lessons of Foxfire et al in oral history. The pictures and most concrete information are from 1972.

Arctic Norway is usually not referred to in that manner. The Gulf Stream that gives Norway its famous ice-free harbors is enough of a warming influence that there is no permafrost or treeless desolation until one crosses clear around to the Arctic Ocean: Russia.

Norway's fjords are famous. What is hard to understand is that the whole country is like a 1,000-legged starfish. There are a thousand mountain ridges reaching from a central spine toward the ocean and a thousand sea-floored valleys between. Generally speaking, each valley defines a community – a watershed system. Communication with the people in the next fjord required either setting to sea and sailing around the point or climbing over the ridge. Either

View from the megalith. This is a freshwater fjord (4 - 5,000 ft. above sea level) but all general rules apply. This is a town center but eminently typical. The flat spot mid-left was an irresistable stroke of luck.

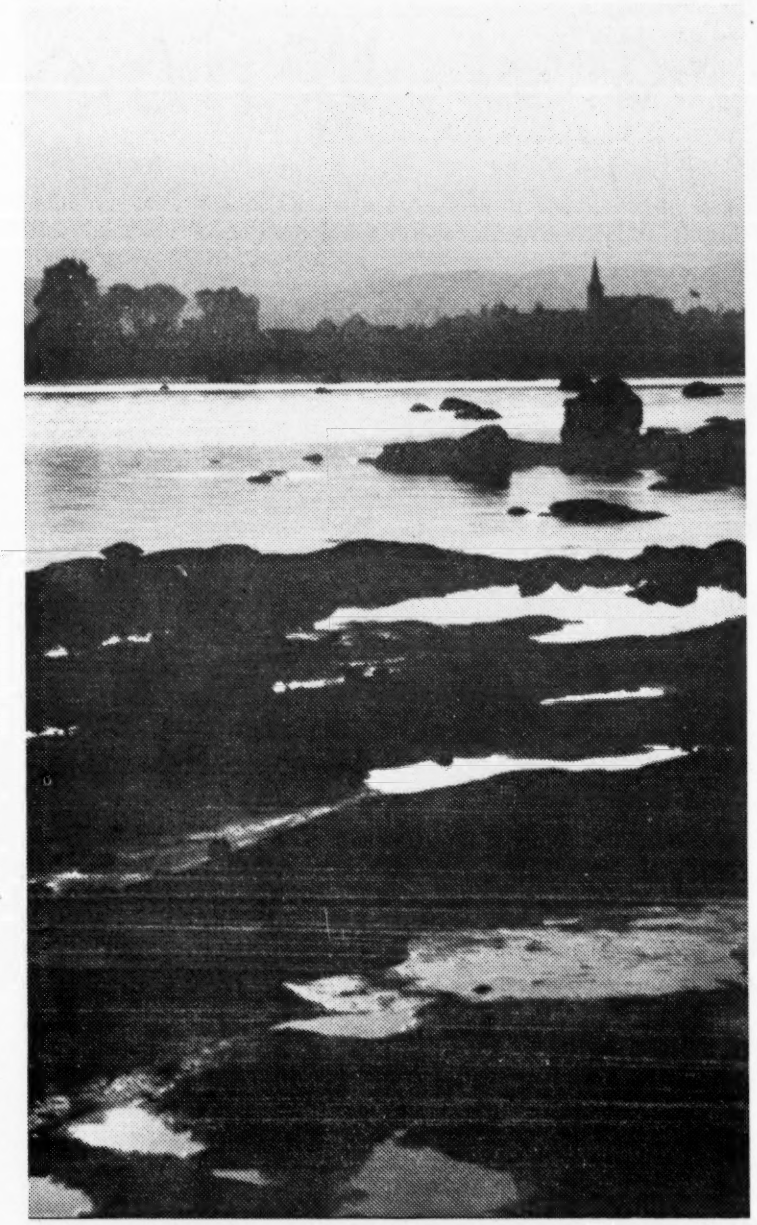
method was a day's trip before the auto. Most of the time the trip was just too much trouble. Each fjord or village developed dialectal peculiarities of its own because of this semi-isolation. Adjacent fjords produced only slightly different speech but Norwegians from opposite ends of the country speak almost different languages. There is a radio program in Norway on Sunday afternoons where farmers and shopkeepers from various parts of the country come on and tell a little anecdote or answer a few questions. Then a panel of philologists and linguists figure out where the speaker is from. Usually they place a speaker within a mile or two, just like wine tasters in the movies can tell which side of the hill the grapes grew on. It's a law in Norway that all schoolteachers must speak and teach the dialect of the village where the school is located. Most Norwegians can understand all of the other dialects and can speak many of them if necessary. The general practice, except for schoolteachers, is that everyone speaks his own dialect. Often there are 3 or 4 people in a conversation each using a different word for the same thing. All four words may be perfect synonyms but each will stick to his own word and expect the others to do the same. Norwegians are very verbally aware people. Even fishwives and farmers have to be ready for anything if they expect to listen to the radio or watch TV.

The shape of the land has imprinted most everything as strongly as the language. To this day to go by train from Oslo to Narvik you go east to Stockholm, then north through the Swedish plains and only at the last minute, well above the Arctic Circle, the train goes west, over the mountains, back to Norway, to Narvik. The coastal steamships take two to three weeks from Oslo to Kirkenes (the Russian border) and stop at every third or fourth fjord. The generic term for this boat service is still "the fast route."[1]

Roger Hyde is the editor/publisher of Washoe Press and works in the Let's Go Fly a Kite store in Los Angeles. He flies kites on the beach and in nearby vacant lots owned by Howard Hughes heirs, whoever they may be.

—Anne Herbert

1. Liquor in Norway is sold only by the federal government through State liquor stores — the Vinmonopol. Norway is a tough country to get around in, the area is smaller but the distances are about the same as the length and width of California. Now it's true that there are only 3 million Norwegians but it is remarkable that in the whole country there are still only 41 liquor stores (and 4 wine-only stores). You can buy booze by the glass in rare spots but how Norway can have an alcoholism problem is a puzzle. (If you promise not to spread it around, I'll give you a clue: "Do-it-yourself.")



Tidepools at midnight looking north on a stormy night in August. The silhouetted church at right is where my grandmother was confirmed and her parents buried.

Norway is built on hillsides. Slopes generally level out in the bottoms of the fjords by the shoreline, and most of the time that is where the houses are. Each farm, as constituted in the last two to three centuries, is a self-contained system defined by the terrain. The raw material is almost identical throughout the country: a mountainside, covered with dense forest, sloping down to the water's edge. The water was the access route and the most reliable source of sustenance. The best place to live was 30 - 40 yards back from the water (or wherever the most convenient flat spot was). Everyone had boat access in front of the house and the forest behind. If the fjord ridges were high enough to support snow buildup through summer, little streams would trickle down through the forest supplying fresh water. Where the ridge was low, a fresh stream was usually flowing down the bottom of the fjord from far inland. At the point where the finger of the sea reaches farthest into the fjord there is often a fresh-/saltwater interface (a null zone). The fjord where my grandfather was born was very long and high and it had streams coming down the sides and a strong creek flowing down the center. The interface in that fjord was pushed maybe a quarter of a mile out into the open water of the fjord. You could fish in what was plainly the ocean and catch trout and other freshwater fish. Just a few yards along the shore, or even in that same place on a different day, you could catch saltwater fish.

The forest was above all a source of firewood. Let's face it, the Gulf Stream will not cook your dinner and the Arctic is the Arctic. I can testify, however, that over 100 years of sustained use of the same homesites has still left the forest edge within 50 yards of the houses and not noticeably thinned. And they burned a *lot* of wood. These symptoms apply not only in my relatives' fields but all over the country.

The Sun is up all summer but down all winter and the cold is ridiculous. The dark does odd things to people. One of my grandaunts has a streetlight attached to the side of her house (in addition to porch lights, etc.) to light up the whole yard. But even my own family, after they had opened up and shared family secrets and dirt, would not discuss "the dark time."[2] I have only been there in summer when night ranged from 0 to 3 hours of darkness. My old uncles in their 60s and 70s would stay up until 1:00 or 2:00 a.m. in the midnight sun: just talking, having coffee, etc., – all the while knowing full well that they had cows to milk and jobs to go to by 7:00 or 8:00. In May-June-July up there the Sun floats in a circle around the sky. At 6:00 a.m. the Sun is in the east and it crosses overhead through the day much as we see it every day. But in the evening when it has gone to the west it doesn't fall into the ocean. Instead it curves off to the north and through the night floats eastward above the northern horizon in a long, sideways dusk. As it gets back toward the east it curves back up and by 3:00 or 4:00 is good and bright. The nights are very weird at this time. Nine p.m. and 3:00 a.m. are barely distinguishable from 9:00 a.m. and 3:00 p.m. Except that around 6:00 or 7:00 p.m. (regular average sunset) all of the birds, cows, sheep – everything – shut down. It is a singular experience to walk along a country road, the Sun is shining, there is a gentle, warm breeze, but everything is as still as if they had dropped the neutron bomb. No people, no cars, no animals. No insects! And if you look closely you see flowers closed and leaves held in inattentive postures even though there is sun. At times like that the world is a blank slate. It is very easy to rhapsodize and start writing your own ticket. Next thing you know, Kirk Douglas and Tony Curtis have dragged a huge dragon ship up on the beach. . . .

Between that kind of peak mood and the opposite paranoia of ceaseless black it is little wonder that the Norse fantasy world is full of monsters, trolls, elves, dragons, giants, and electric heroes. Most of my relatives and their neighbors, judged by urban (even Oslo) standards seem a little nearer the edge than the rest of us.

The geography (and dependent ecosystem) and these radical weather/season patterns are the organizing factors in farm management in Norway. And farm management patterns are still the organizing force in the culture.

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2. There was an engrossing pair of articles on the human reactions to the dark time, in the *New Yorker*. Everyone goes slightly bozo.

Norway was a bumper car track for glaciers. Virtually all soil is glacially ground up rock. Lichens and biological forces have long since broken down the talus into soil, much like anywhere else. But in Norway the soil is well mixed with rocks and boulders of all kinds that didn't break down completely. The fjord bottoms are filled with all the crumbs from sand to monuments, left in the wake of the glacier that cut the gorge in the first place.

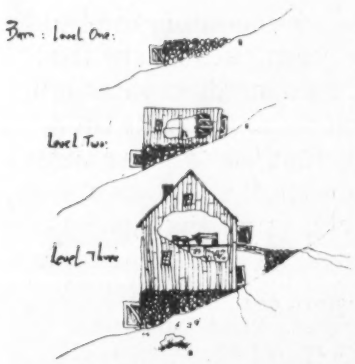
So, to begin farming, you find a spot near the fresh water and by the shore. Then roll back the forest around the spot you like. And lastly, dig up a few thousand rocks. These are the preconditions for setting up business almost anywhere in Norway. Happily, for most Norwegians this basic, epic task was accomplished two to eight hundred years ago. In 1972 I had the dubious privilege of helping out a friend who had just bought a cabin and moved it to a new foundation up the hill, on a virgin site. He wanted to put a garden beside the house. The trees had been cut down the year before when the house was set up, but the ground was strictly original equipment. We had wheelbarrows, crowbars, levers, shovels, claw cultivators, et al to clear the spot. It took us over 5 man days to clear a 20' x 30' area. As inevitably as action/reaction, when we finished, the garden had a stone retaining wall at the foot to ease the slope.

This cabin was about halfway up the hill in the fjord where it stood and a road ran along the face of the hillside just below the lot. Just a hundred yards or so up the neck of the fjord was a giant rock cliff. One incredible stone three or four hundred feet high, standing up in the valley like a small Half Dome, just to one side. On top of this cliff was a level spot where soil had filled in between the megalith and the ridge a couple of hundred feet higher. Sitting in this pocket meadow was a house and barn surrounded by acres of just-cut hay. Very pastoral. On the cliff side of this soft, undulating meadow was a rock fall of rocks and boulders of all snapes and sizes, thousands of rocks, thousands of tons – all dumped there individually.

The foundations of almost all farm buildings are stone. Why? Because they're there. The superstructures of almost all farm buildings are wood. Because it's there too, and because by this stage in the game a farmer will be so sick of rocks and carrying rocks and stacking rocks. Well, let's just say he prefers not to build a stone house for reasons of taste (and the expressive, malleable nature of woodwork). But before the house comes the barn.

The barn will have to be built on a slope. It must house five to ten cows, a few sheep, a couple of goats, and all the food they need for the winter. The system

Farm from the megalith. Note: ramp beside barn; gamme variation building (front right); boulder rubble (across right foreground).



is vertical and stores energy all summer. In winter, when no one has any, minimum energy is required.[3]

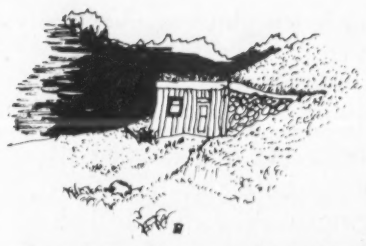
The archetype barn has three stories. The bottom is stone, cemented in place, or in older versions simply stacked with dirt fill in between. This lower level is an extension of the hillside, in effect just a platform. But there were one or more rooms in this foundation. On the side there may have been a storeroom or a root cellar; but the main function of this level and most of the space was for manure storage. All sorts of hay or straw were regarded as food and so grasses and absorptive floor coverings were not used for livestock stalls except for animals that would lie down. Trap doors were built into the floor of the second level and all animal waste was pushed to the holes with flat boards mounted like push brooms. The center of that downhill side of the stone foundation always had a big double door, under and through which flowed a manure bog. The whole downhill side of the barn was a waste treatment plant and nothing was ever downhill from the barn. Often that side of the building had no windows. Nobody ever imported fertilizer.

The second floor was mainly just stalls for the animals. The stall area had a seven- to eight-foot ceiling (to keep air space heatably limited), and the stall floors were three or four inches above the level of the corridors. I have seen troughs about one foot wide and two inches deep along the center of stall corridors. At the wall end of the troughs were the trapdoors and manure pushers had blades (say 1' x 4") that fit the troughs very efficiently.

A space on the second floor, typically 8' x 10' or so, that is convenient to the stalls will be a large stall that is open to the third floor and loosely closed in on the sides. This is the hay chute, and crib for the short term.

The third level is an immense room open to the rafters. Access is by a ramp or road higher up on the hill. In American barns, hay is baled and hoisted to the loft door by block and tackle. In Norway, hay is never baled but is loaded loose onto a wagon. The wagon is then driven up the road to the loft level and driven inside. The loose hay is unloaded from the wagon while the wagon sits on a platform above the third level floor (second level ceiling). When the third level is filled so that hay is heaped up on all sides of the platform, the hay layer above the livestock level is both gravity-fed food supply and insulation. Cows

3. The opposite phenomenon to everyone staying up all night to chat in summer is everyone going stir crazy in midwinter. Very macho old grandpas will have fabulous feats of knitting and embroidery stuffed in every drawer. Embroidered napkins and pillows are just as often the men's work as the women's. And Christmas at the heart of the darkness is everyone's rescue. It is strenuously celebrated for all twelve days and no matter how cold and rotten it is everybody visits everybody else before Twelfth Night. It's pure self defense. The dark really *can* get to you and curdle your brains.



are pretty good heaters and the barns were leaky enough that body heat supplied most of the warmth and leaks kept air from getting too stale. My great-grandfather's barn was a giant fireplace for supplemental heat and non-culinary cooking (rendering, dyeing and washing – who knows?). The heavy foundation was insulation from below. In winter, animal care is very simple. Put a few faggots on the fire, a quick cleanup via indoor waste treatment system; a little hay via indoor hay storage, and then milk. Almost all labor is displaced to the summer. Water was supplied long ago by wells, often in the cellar of the house; later, pipes were laid to cisterns up the hills (serving both house and barn). The system is virtually a defeat of crippling winter weather. There was room for wood storage in the barn too – everything was internalized. A Noah's ark for overwintering.

The use of the hillside is central to the systems. I have seen dozens of barns that were built on fairly flat farms where the barn was pushed up against any knoll, even out of the way, or earth ramps were built up from the flat to the two upper levels.

Building on the slope has apparently affected the whole school of Norwegian rural architecture. I hypothesize the following evolution. Given the slope and the need to maximize materials, a shack builder could build a front, a roof, and two half sides and have his building set into the hill. Certain problems are created by this means but the structure is only a walled-in lean-to: very easy to build. Keeping a dry floor is one problem. But in digging into the hill, most of the needed material for a stone floor would probably be encountered. Same for the hillside walls. No matter what kind of roof put on the cabin, the hill would be inclined to gradually dribble down on top of it. It seems to have been discovered very early that that was an asset. A sloppy, leaky, thin wood roof when covered with four to five inches of dirt and a healthy crop of grass becomes a model of strength and insulation. Using this small cabin as a cellar, which it was anyway, a dry-floored room could be built on top, still letting the hill out onto the roof.[4] This second floor house would then be safe from snowdrifting because of its high down-hill face; and have all the advantages of earth coverings and heat banking. Entrance from uphill or the sides could allow the second floor to be just as convenient as the lower one. I have seen many houses that have this second-story entrance system even though the top floor is a free-standing wood frame house. In fact, I have seen houses with the cut-in basement as described, with an outside door on the downhill side, an upper floor with a door at the ground level on the uphill side, and also a door in the upper floor on the downhill side – ten to twelve feet above the ground for deep snow.

4. There is a Norwegian folk tale about a man who had his cow grazing on the roof and had it tethered by running a rope up the chimney. He tied the rope to himself to demonstrate to his wife how to mind the cow and do housework at the same time. Then the cow fell off the roof. . . .

It became standard practice, and this is the phase that is still extant throughout the countryside, to build sheds, cabins, etc., either as cut-in cellars or free-standing on a leveled spot but still with the crop-bearing roof. These are called torvtak buildings – literally "turf roof." It has long since become déclassé to live in these buildings and so it is almost impossible to find anything but sheds and outbuildings made this way. Shingle roofs, while produceable from local resources are a great waste of time and effort compared to making a torvtak. Norway is very wet – either rain or snow all year – and very hard on shingles.[5] Torvtaks just get healthier when wet. Asphalt and tin roofs have become the favorites nowadays but they are solidly dependent on a monetary economy. Even in 1960 my Grandfather's home fjord had only two stores: a baker and drygoods/butcher (there were a mechanic and a gas station but those were not for the local population). The farm system was carefully engineered to be a whole, closed system. There were negligible cash crops and very little specialization. Cash entered the system mainly in the postwar eras through the export of people – to the merchant marine, military, and the modern small urban specialties (laundries, electricians, plumbers, etc.). Out of perhaps twenty second cousins I have there (my generation, with common great-grandparents), there is only one who is continuing to farm (Go Alf!). The others have mostly moved to town, and all work in modern, specialized occupations. The money source has shifted from the land to industry and money is extensively redistributed by the government.

5. What you and I would call "cloudy," "gray," "overcast," etc., are called in Norway "oppholdsvær" — literally: "upholding weather." The idea being that whatever it looks like, the important thing to know about today's clouds is that they are not going to drop any of several troublesome stuffs on you.

The non-specialized, whole system farm seems to have been the rule for hundreds of years because the land use policy best suited to it is the land division system that stands in place. Every farm needs (a) the shoreline access, (b) the cleared hayfield/garden/homesite at the hill base, and (c) the hillside forest (fuel, forage, game).[6] This, in practice, yields farms that are 50 -

6. The woods are very lively places. Lots of berries, mushrooms (and poisonous mimic species), etc. There used to be wolves and bears and still are reindeer and European moose. Side track: The European moose is called, in Scandinavia, an "elg." Obviously the word is cognate to the English "elk" but the animals are not. I have a friend who was an editor on *the* Norwegian-English dictionary and they got in quite a soup over this. The American moose is *Alces americanus.* There is the Alaskan moose *Alces gigus.* In Scandinavia there is the European moose, *Alces alces,* or *Alces machlis,* which is smaller than the two American species (but *same* genus). The elg, when mature resembles very closely a bedraggled American moose yearling. The American elk, *Cervus canadensis,* is most closely related to the European deer or hart, *Cervus elaphus.* N.B. the Norwegian Elk Hound is really an elg hound.

This kind of translation funny stuff goes all across the board. The Norwegian word for squirrel is ekorn (pronounced acorn). In English the word "dirt" means earth or ground. We also have it as an adjective "dirty" meaning soiled — earth contaminated — composty, mildly unclean. The original word "dirt" was actually "drit" and we changed it over the last few thousand years (a very common sort of transmutation). We also had a word "shit" which originally meant substantially the same thing as "drit." Over the years "dirt" became the simple businesslike term — the objective, mineral term. "Shit" became the compost word and became the social outcast — it meant filth and became so extremely charged as to be an alarm. In Norwegian the word "shit" means earth or ground. Its adjective form "shitne" means soiled, dirty. They have a spinoff, "skit" which means pretty much what "filth" does in English (extreme but genteel). But in Norwegian, good old "drit" is still alive. It means shit — human excrement — and it gets used when you hit your thumb with a hammer and it makes ladies blush. Exactly parallel evolution with exactly opposite results. Makes you wonder. As I was saying: "Every farm needs (a) the shoreline access, (b) the hayfield/garden/homesite at the hill base, and (c) the hillside forest (fuel, forage, game). . . .

A torvtak shed-barn and wood-frame gamme.

100 yards wide at the water's edge and extend up the hill in a strip. The property may be fifty yards wide and extend miles up the hill through inland valleys, lakes, etc., until the property extent from the other side is reached (usually the watershed). Borders and fences are pretty well limited to the lower, cleared land. The forest is treated as common property once you get far enough up into the trees that the boundaries start to blur.

I have only once seen the nth degree of the Norwegian principle of crawling under the topsoil for protection. Oddly enough, these seem to be the only torvtak structures that demand a level site. In order for a structure to employ the turf insulation on all sides it must slope on all sides. The possibility of digging entirely into the hillside seems to be too damp, too much work, and mostly suicidal (when several yards of snow cover everything). The result is a tilt-end A-frame building – a lengthened pyramid. These buildings rise up out of the rolling grass like a geological pimple. These buildings are called gammes (rhymes with commas), a Lapp word. One of the two gammes at the site I visited (near Narvik) was built on top of a tiny promontory, as its peak. The idea apparently is to have horizontal egress that will lead to the surface of the snow pack in Winter.

When Erik the Red colonized Iceland they built a community of wooden and stone buildings. According to the ruins, the only building with a turf roof was the church. It was a tiny gamme off to the side. Erik was a pagan (Odin, Thor, & Co.) but his wife and a few others were Christian (quite a story in itself.) So the church was kept tiny, unobtrusive, and a minimal investment in time and materials: a gamme. It seems that even a thousand years ago the turf constructions were déclassé. It didn't help that "gamme" is a Lapp word, probably because the Lapps were the exponents of the turf hut during the last thousand years and its reputation suffered with theirs. (Lapps are functionally Scandinavian gypsies and have a rumor literature amazingly similar to the classic Gypsies'.) But one can imagine a time 2000 years ago when the gammes were the key to being able to occupy those northern lands at all. The gammes in the pictures have conventional doors and windows, resembling a hobbit's or other fairy tale residence. Inside they are just boards attached to the A-frames and roof beam. Erik's wife's Iceland church apparently had one end of planks only, where the door was. Variations and derivations are infinite.

My relatives who live near the Narvik site were inclined to apologize for the presence of these buildings and

My grandmother's brother and his second wife in front of my great-grandfather's barn. Note the ramp: cows enter under the ramp. The rough-hewn poles and A-frame beside the ramp foundation are for hay-drying fences.

were a little reticent about going to see them. At the same time everyone knew all about them and had been there themselves. These are really cabins, possibly originally winter hunting cabins. It was common years ago to have cabins up in the hills where one or family members would go with the livestock in summer. (Many families hid out in these cabins for the duration of the war to escape the anguishes of the Nazi occupation.) But these cabins did not need the benefits of turf walls, though they might have been built for summer as torvtaks because of the economy of that method. The barns and out buildings that appear to be of similar age to the gammes, and in accessible position, are small – possibly just summer milking sheds/rain shelters. Or possibly winter horse-only small barns. Maybe both. Unless parts of the puzzle are missing, on a full-time basis these would have been poverty level homes. More likely, these were part-time residences, probably for winter. My great-grandfather had a large farm, large house, and large barn and still had barefoot, starving children dangerously often. To participate in less than a whole-farm system was to be dead in that country. Access to the whole three-zone system (and the wits to use it) was essential. Root crops were very important and stood a chance of storing into the winter. Dairy products became specially important in winter (Norwegians eat *lots* of cheese all year), as do fish protein and vitamin D. In summer, all of Norway goes berry mad. Vitamin C and related factors are very scant in basic Scandinavian diets and several kinds of forage berry are almost the only source. *Everyone* gathers berries, *everyone* loves them, and every household cans or freezes berries, if nothing else.

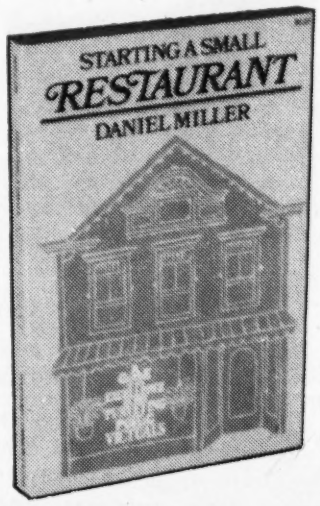
In 1972 there were torvtaks all over Norway. They were also universally on the verge of collapse. I take solace in several facts: (1) Lord Kenneth Clark begrudged the Viking culture the appellation "civilization" because they weren't conscious enough of the long term (a key symptom of which was building in stone). A goodly number of the Viking-era wooden structures (which they clearly saw as the medium capable of the emotion and vibrance they needed from their art lives) are having their 1000th anniversaries and still are vessels of moving character: what is fleeting is less so in the snow forests. (2) Norwegians are monumentally sentimental and new torvtaks are being built once in a while. Plastic sheeting between the soil layer and the interior ceiling makes them better than ever. (3) Norway stayed out of the Common Market when it had the chance to join because they were explicitly concerned with foreign capital exploiting their sea coast for manufacturing and shipping installations. They like the countryside as it is. It looks like Norway may be one place where "progress" has come late enough that Norwegians may know better than to covet a wilting flower. They seem to be proud of their place in occidental culture (Ibsen et al) but not as unscrupulously ambitious as the rest of us. And most everyone who owns land owns a shore/meadow/forest strip. Those people are not likely to redivide and lose a zone. It would be like selling one volume of a trilogy. ■

Starting a Small Restaurant

This is an extraordinary book in many ways but it will be most useful to those people who think their cooking is great and that they should do it in their own restaurant; next in line will be those who read it and still want to open a restaurant. No other comparable book exists. This is a unique and tough, hands-on guide to doing it. It is fun for all those people who like good restaurants, think they know why some are good and others aren't and for those people who wonder how the complexity swirling around them in a restaurant gets translated into a profitable business.

—Michael Phillips

Starting a Small Restaurant
(A Guide to Excellence in the Purveying of Public Victuals)
Daniel Miller
1978; 180 pp.
$6.95 postpaid
from:
The Harvard Common Press
The Common
Harvard, MA 01451
or Whole Earth



The layout of the restaurant should allow the server to proceed to the pickup point, take the order ticket, pick up the meal plates, and deliver them, all in less than a minute. In sixty seconds, a hot meal loses little flavor or heat. In 180 seconds it can lose its "piping hot" quality, and the dinner partially loses its initial delicious aroma as well. The main advantage of a small dining establishment is that it can fulfill this implied promise to its customers: hot food will be served hot and cold food will be served cold. Your servers must understand this principle. If you wish to infuriate a chef, design your kitchen so that orders cannot be picked up within forty-five seconds after the call.

•

If your restaurant is dependent on transient customers, one of the tricks of the trade on a slow day is to have all employee vehicles parked in front of the place.

Mail Order Moonlighting

This is the authoritative and best up-to-date word for anyone in the mail order business, or planning to start one. No baloney, the real thing in a field full of phoney books. Every useful detail is covered. CQ staff should all read it. Arthur Hoge, Sr. deserves the title "Sr."

—Michael Phillips

Mail Order Moonlighting
Cecil C. Hoge, Sr.
1976; 399 pp.
$6.95 postpaid
from:
Ten Speed Press
900 Modoc St.
Berkeley, CA 94707
or Whole Earth

Mr. Roebuck started first, selling *one item only . . . watches,* and only one basic kind of watch with very little choice of styles and sizes. Mr. Sears took over and sold one additional item after another, until he spread or, it is said, rather sprawled his operation all over Chicago . . . in lofts and cellars and small offices . . . and initially *without* a catalogue. Mr. Sears, like some mail order men today, was said to be a bit of a mail order buccaneer. Not all his items would pass the laboratory tests Sears now requires. Not all of his first advertising copy (and it was often longer then) would now clear through the Sears internal censorship for factual truth and accuracy. Mr. Sears ran ad after ad in the same issue of individual magazines; sometimes up to thirty or forty of them. The catalogue seemed to come into being as an overgrown cluster of package enclosures, which in turn started one by one.

THOSE DHARMA BHUMS

BY R. CRUMB

THESE OIL COMPANIES ARE GIVIN' IT TO THIS COUNTRY RIGHT UP ITS CANCER-INFESTED BUNG-HOLE! WHO'RE THEY KIDDIN'?!

OF COURSE!! WHAT A COMPLETE FARCE! THEY SHOULD ALL BE TAKEN OUT AND SHOT!!

IT'S ALL THE FAULT OF THESE FRONTAL LOBES RIGHT HERE!

I READ AN ARTICLE IN THE "VOICE" ABOUT THE NUCLEAR POWER INDUSTRY... IT WAS REALLY—

TH' BIG QUESTION IS, HOW DO YOU CALL A HALT TO TH' DAMN THING?? HOW DO YOU GET CONTROL OF IT, INSTEAD OF IT CONTROLLING YOU?!

WELL, IT'S UP TO THE PEOPLE TO PUT A STOP TO IT, DON'T YOU THINK? I MEAN—

MAN!

WHEW!!

I'M NOT TALKING ABOUT THAT, SPECIFICALLY... WHAT I'M SAYING, SUZETTE, IS, HOW DO YOU GET THIS UNDER CONTROL? THIS BIG RAGING HUNK O' GRAY MATTER UP HERE!?!

THAT'S TH' MAIN PROBLEM!!

OH! HA HA HA...

HOW DO YOU KEEP FROM GETTING ULCERS IN MODERN AMERICA... THAT'S WHAT I'D LIKE TO KNOW!!

KEEP THE BODY ACTIVE AND EAT HEALTHY FOOD...

GULP!

YEAH, YEW... YOU NARCISSISTIC LITTLE PRANCING PRINCESS! YOU BRAT, WITH YOUR JAZZ DANCING TROUPE... OH BROTHER!!

YOU LOVE IT, JAF... YOU ADMIRE A WELL-FORMED FEMALE... DON'T COME ON WITH THAT HIPPER-THAN-THOU CRAP!

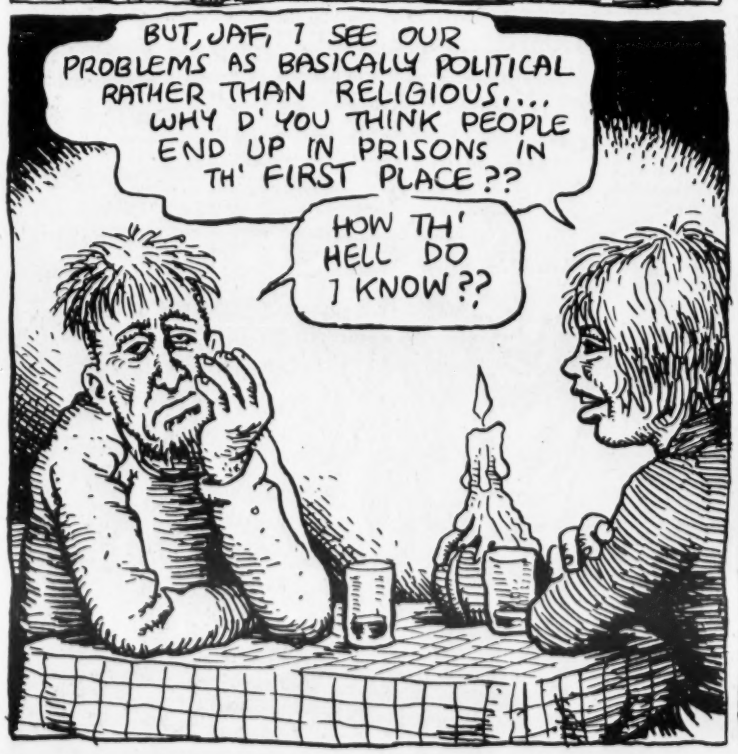
SHHHEESIS!

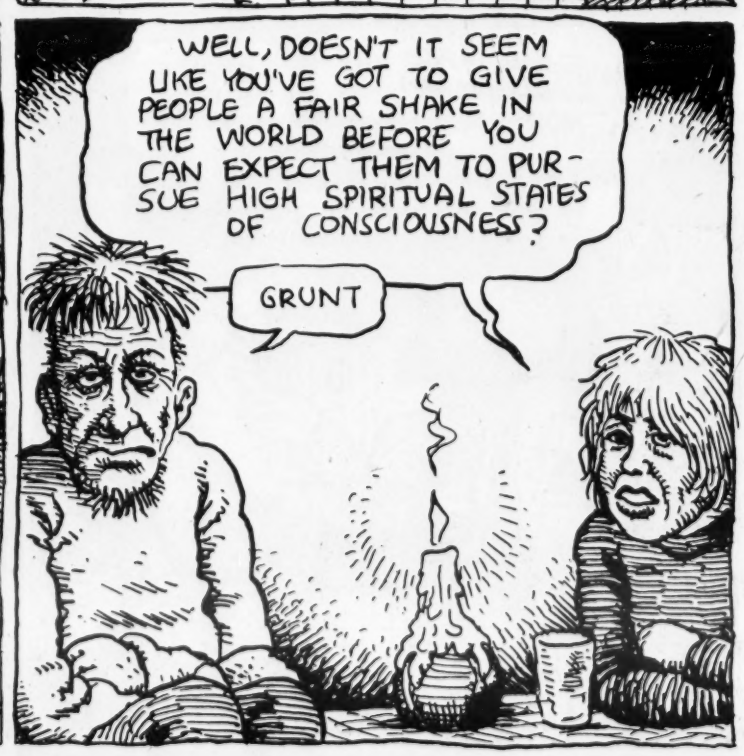
OKAY, OKAY.... INSTANT GRATIFICATION, HERE I COME!
GLUG!
THIS IS AN EXCELLENT BURGUNDY...

YOU LITTLE HEDONISTIC NARCISSIST! I'VE GOT TO BITE YOU!!
HA HA HA... SILLY BOY!!

GNUNG!
AAOOW!

JEEZIZ... AREN'T YOU THE HOT-BLOODED BEAST!!
I KNOW..I SHOULD BE LOCKED UP IN A ZEN MONASTERY FOR FIVE YEARS—HEY! Y'KNOW WHAT? THEY OUGHTA TURN ALL THE PRISONS INTA ZEN MONASTERIES!!


BUT, JAFI, I SEE OUR PROBLEMS AS BASICALLY POLITICAL RATHER THAN RELIGIOUS... WHY D' YOU THINK PEOPLE END UP IN PRISONS IN TH' FIRST PLACE??
HOW TH' HELL DO I KNOW??


WELL, DOESN'T IT SEEM LIKE YOU'VE GOT TO GIVE PEOPLE A FAIR SHAKE IN THE WORLD BEFORE YOU CAN EXPECT THEM TO PURSUE HIGH SPIRITUAL STATES OF CONSCIOUSNESS?
GRUNT

TALK TALK TALK.... I THINK I MUST GO MAD!
COOL IT!
I'VE GOTTA GET THE WORLD OFF MY SHOULDER... I KNOW, I'LL BACK-PACK UP TO THE SIERRAS AND SPEND ABOUT A WEEK UP THERE EATING NUTS AN' RAISINS AN' TALKIN' TO GOD!
HEY, GREAT IDEA, JAF!!
BUT BEFORE YOU GO, I HAVE A SUGGESTION... LET'S YOU AND ME HAVE A LITTLE TRYST OVER AT MY PLACE... JUST TH' TWO OF US...
"TRYST"?
COFFEE AND CONFUSION
BIG LOUIE'S
LADY WRESTLERS
SURE...OUR OWN PRIVATE PARTY... ORGY, IF YOU LIKE...I CAN BE HAD, JAF... FOR YOU I COULD DO ANYTHING...
ANYTHING??
YOU NAME IT...
I'LL EVEN MAKE YOU AN OMELETTE IN TH' MORNING...
OKAY... SURE... HEH HEH
CLUB NIGHTMARE
EL RANGOO
MY WORST FEAR, SUZETTE.... YOU WANNA HEAR THIS? THIS'S HEAVY... YOU'RE THE FIRST PERSON I'VE EVER TOLD THIS TO...
YEAH, I'M LISTENING... GO AHEAD... I'M ALL EARS..
ESPRESSO

MY WORST FEAR, SUZETTE, IS THAT I MIGHT CONTRIVE TO BE AUTHENTIC... THAT I CREATE A MYTH OUT OF THIS SHODDY EXISTENSE, INSTEAD OF LOOKING FOR THE TRUTH!

TRUTH TRUTH... MEN ARE SUCH FOOLS...

YOU ARE SO, SO RIGHT, GAL... OH GOD... WOMEN, THEY KNOW...

STEVE WILTLE WAS HERE

WOMEN KNOW ALL ALONG THAT TRUTH IS ONLY RIGHT HERE IN THIS ANIMAL MOMENT!!

OH IS THAT WHAT WE KNOW?? HA HA HA!

GRRRR

CAFE

URBANE ROOM

BAR

YOU'RE RIGHT AGAIN, SUZETTE... I DUNNO WHAT I'M TALKIN' ABOUT!! HA HA HA HA HA

NO, BUT YOU'RE A GOOD MAN IN TH' SACK!

TAXI!

....AND GOOD-NIGHT, JACK, WHERE EVER YOU ARE!!

THE WORRY WORTS

by R. Crumb

PEOPLE CALL US THE WORRY WORTS©, BUT THE WAY I SEE IT, THERE'S PLENTY TO WORRY ABOUT!!

I COULDN'T AGREE WITH YOU MORE, MY FRIEND!

LOOK AT THE WAY THE HUMAN RACE IS DESTROYING ALL LIFE ON THE PLANET!

YEAH, INCLUDING ITS OWN SELF!

OH WOE!

IS THERE ANY WAY TO STOP THIS HORRIBLE JUGGERNAUT OF DESTRUCTION AND DEATH?!?

A HANDFUL OF PEOPLE ARE TRYING TO STOP IT, BUT.....I DUNNO...

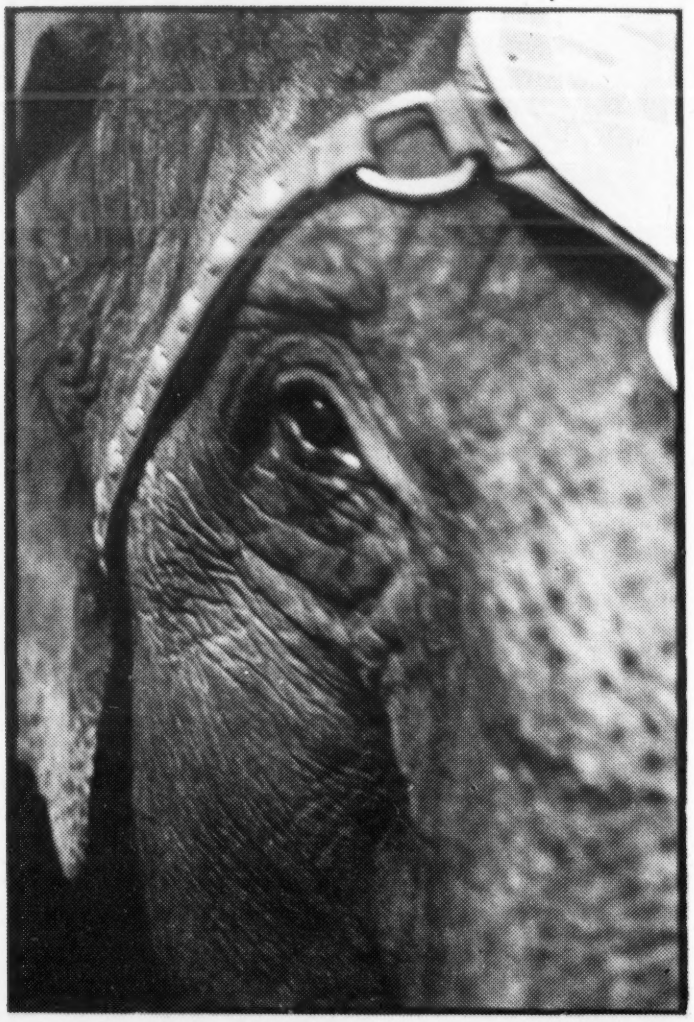
OH WOE OH WOE!

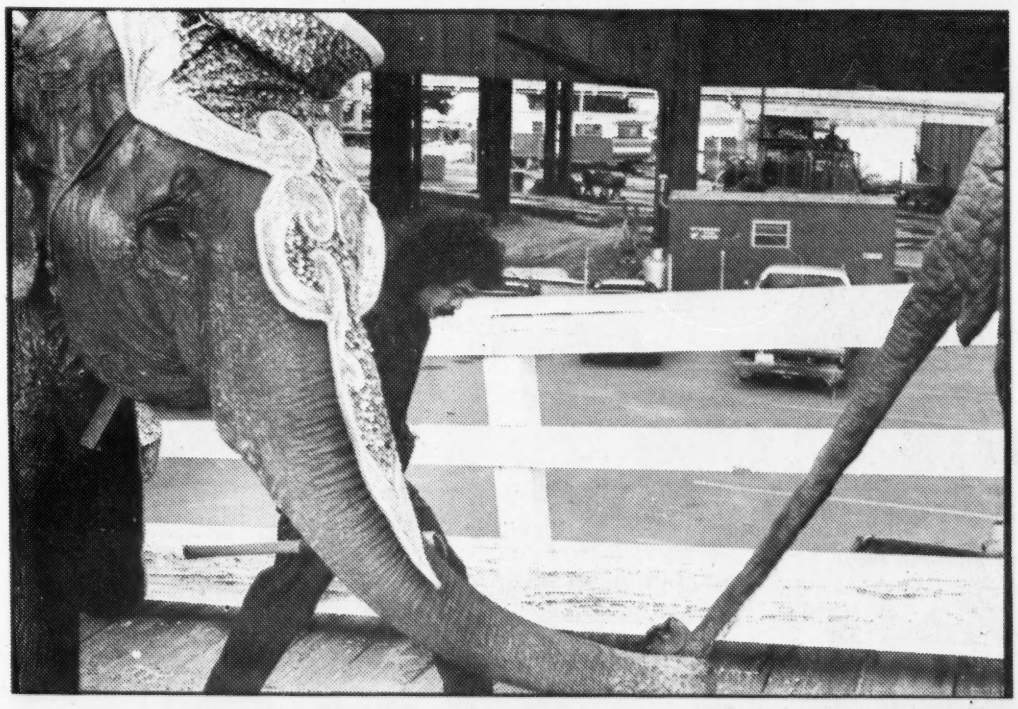
OH NO, OH NO, PLEASE, PLEASE, GOD, STOP THEM BEFORE IT'S TOO LATE!!!

MEN WHO DRESS *ELEPHANTS*

BY

SARAH FISK





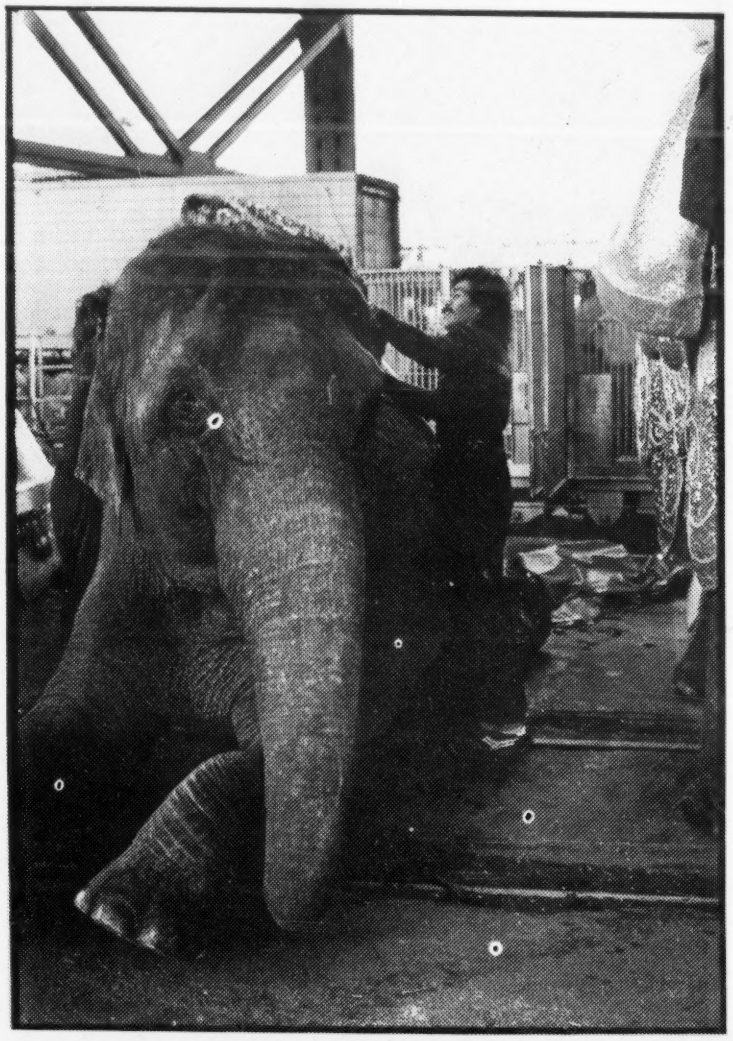
THE CIRCUS IS MADE OF FANTASY BY REAL PEOPLE.

THEY BELIEVE IN THE MYTH THEY CREATE.

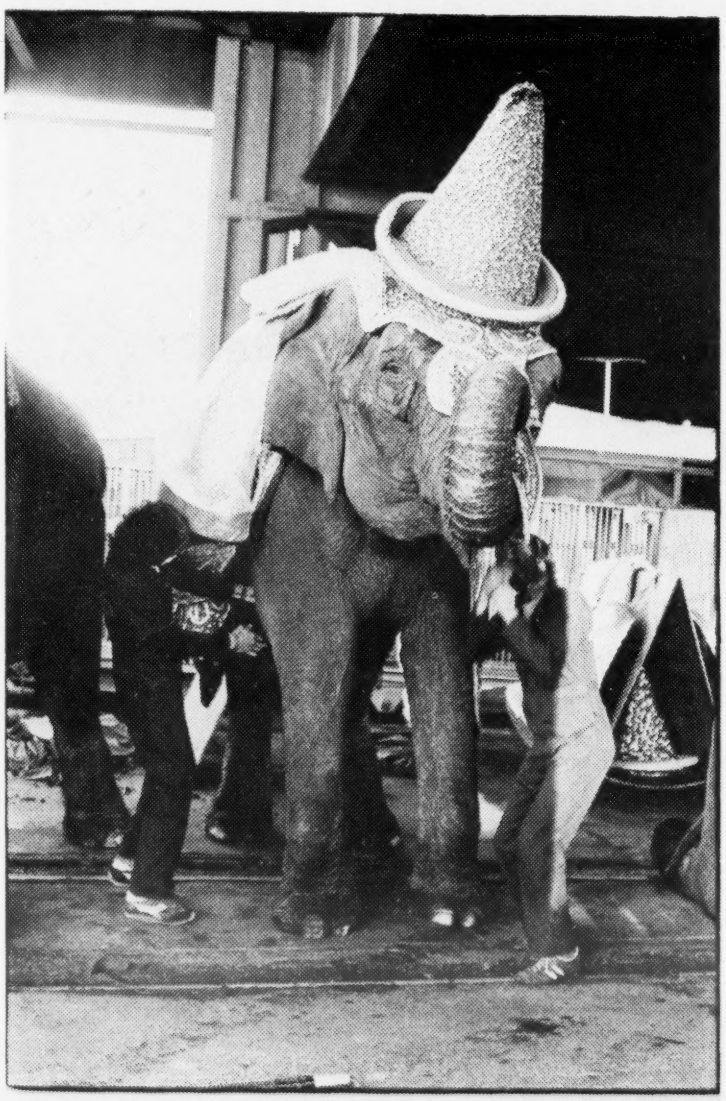
At 17 Sarah Fisk ran away and joined the circus. She spent a week with the Ringling Brothers blue unit while it was in San Francisco, hanging out with elephant keeper Ziegfried O. Solis and his charges Jenny, Marcella, Betsy, Mary, Emma and John. Later Sarah ran away and joined Harvard. This material, shot in Fall 1977 in Boston, was a paper for Robert Coles' Soc. Sci 33 "Moral and Social Inquiry." This spring she graduated.

—SB

THE ROMANTIC MYTH OF WORKING WITH THE CIRCUS MUST BE MAINTAINED IN THE FACE OF DAY TO DAY REALITY.



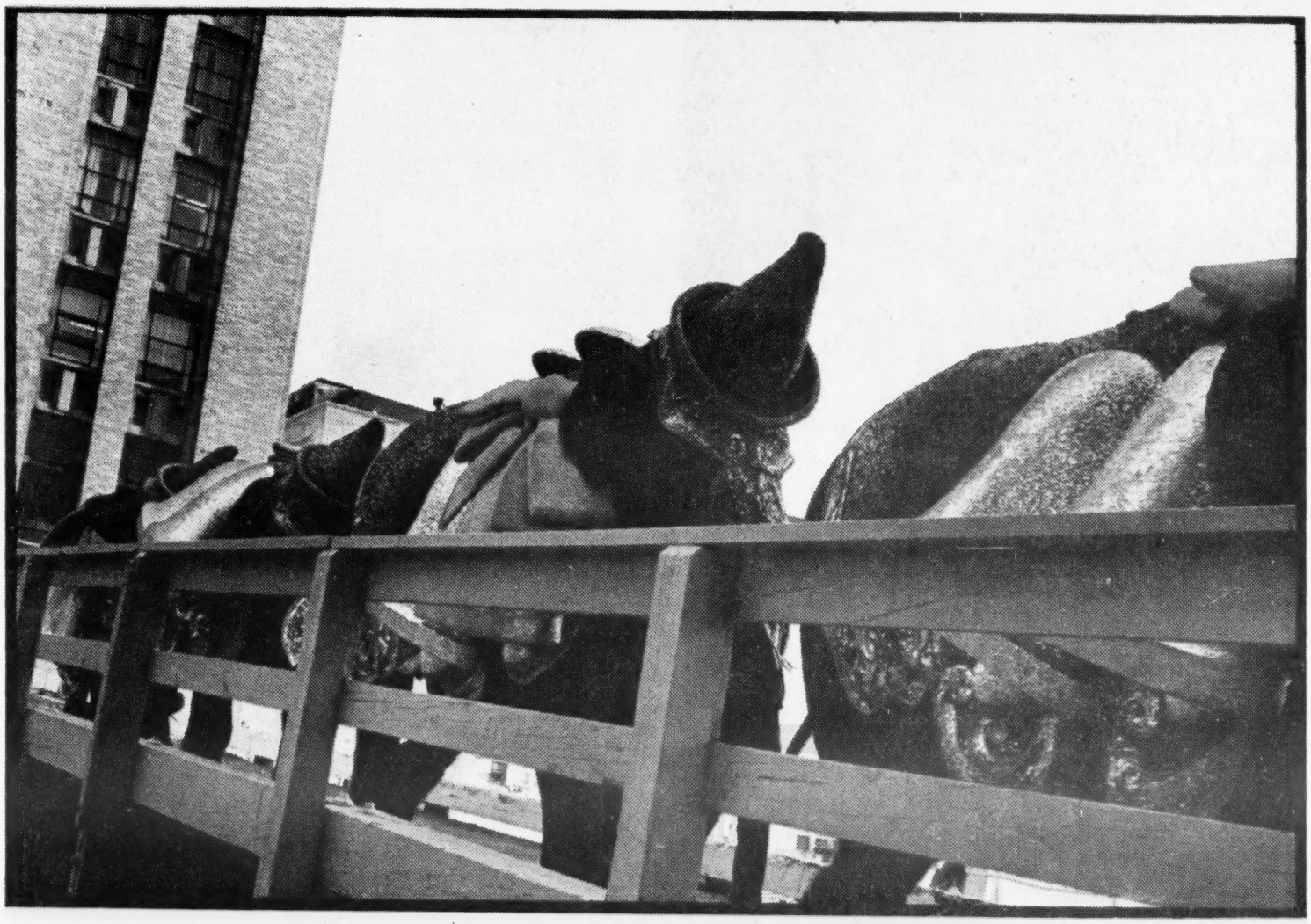
IT TAKES QUITE A MAN
TO APPROACH AN ELEPHANT
WITH AN UNDERSTANDING
THAT CAN BE RETURNED.



MANY MEN WORK TO
TRANSFORM 14 ELEPHANTS
INTO A GLITTERING
FANTASY PARADE

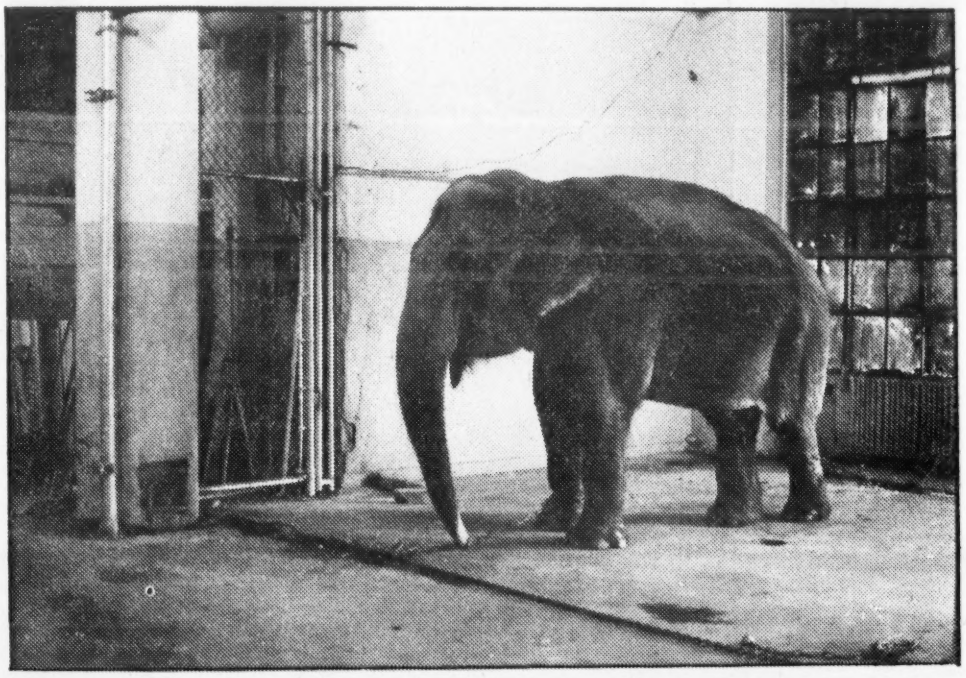
THEY MUST BE
DRESSED AND UNDRESS-
ED FOR TWO ACTS IN EVERY
SHOW TWICE A DAY AND
THREE TIMES ON SATURDAY

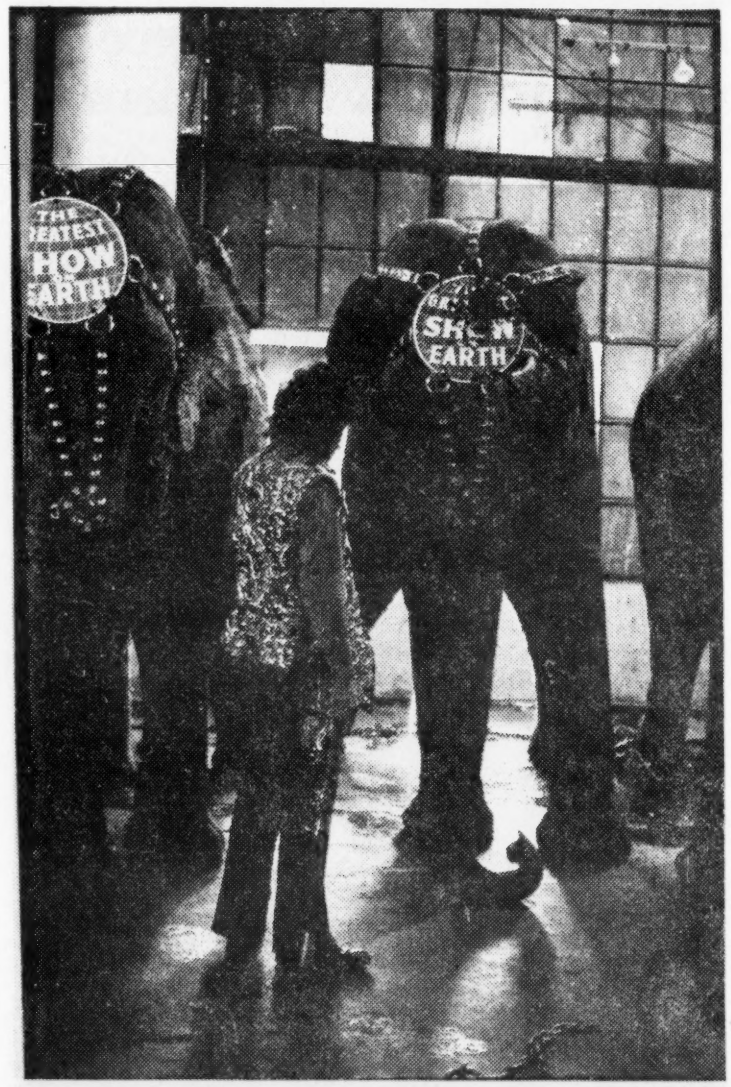
THESE ELEPHANTS HAVE WORKED TOGETHER FOR 20 YEARS.



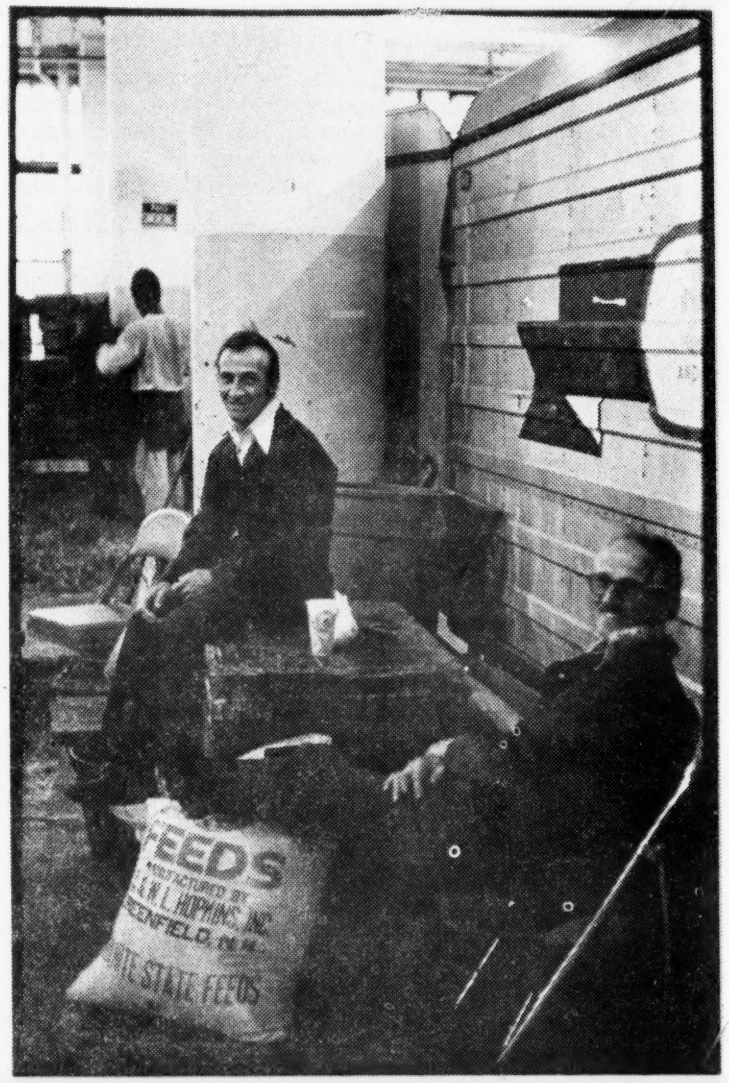
'THERE ARE THINGS EASIER TO UNDERSTAND THAN THE REASON FOR SUCH AN ANIMAL'

CUNA INDIAN CHIEF UPON FIRST SEEING AN ELEPHANT IN A TRAVELING CIRCUS - CANAL ZONE 1930



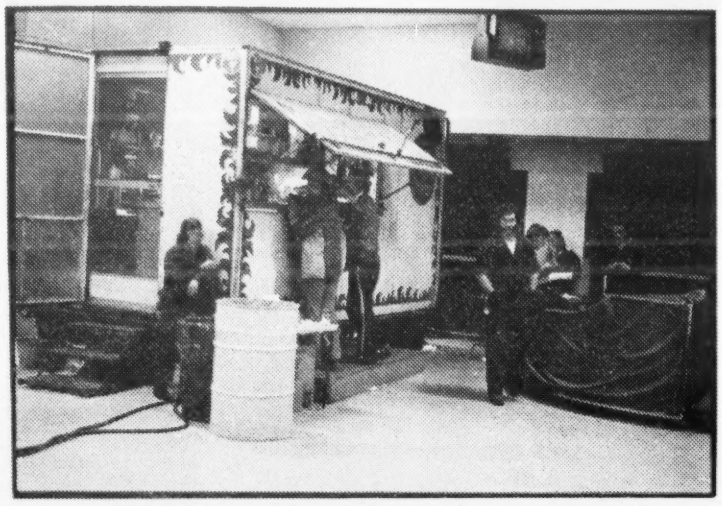


USING THE GERMAN COMMANDS SHE WAS ORIGINALLY TRAINED WITH ZIGGY PERSUADES JENNY TO URINATE BEFORE THE ACT.

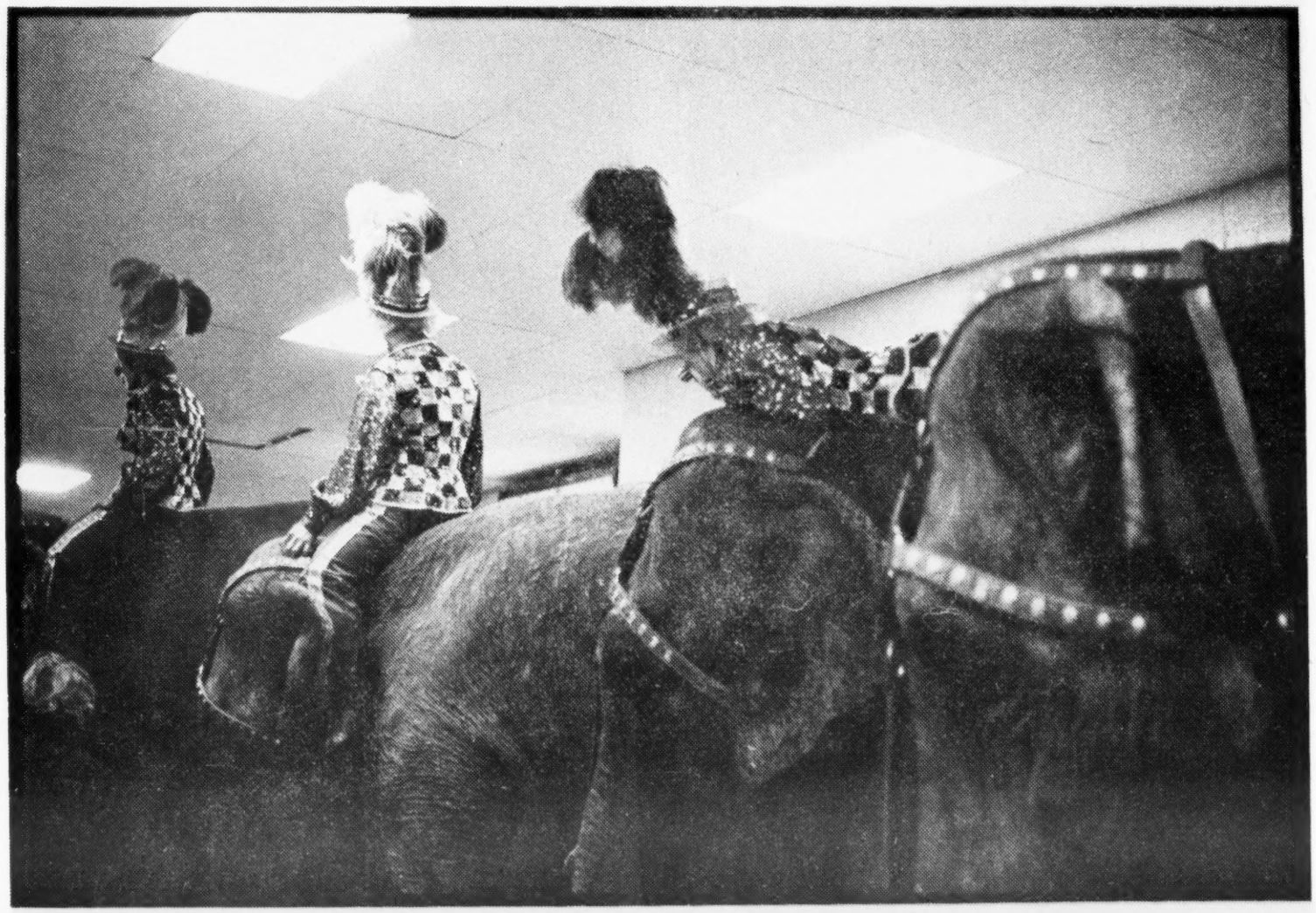


THE MEN WHO CARE FOR THE HORSES CAMELS AND PONIES SPEAK SEVEN LANGUAGES IN ALL

WORKING THE POLAR BEARS
IS LESS PERSONAL ★
ITS MORE LIKE WORKING
WITH CAGES



PIE CAR JOHN RUNS A FOOD
CONSESSION ON THE
CIRCUS TRAIN AND HERE
BACKSTAGE WHERE
CIRCUS PEOPLE BUY FOOD
WITH DISCOUNT COUPONS ★



ANIMALS AND PEOPLE ITS ALL SHOWBUSINESS ★

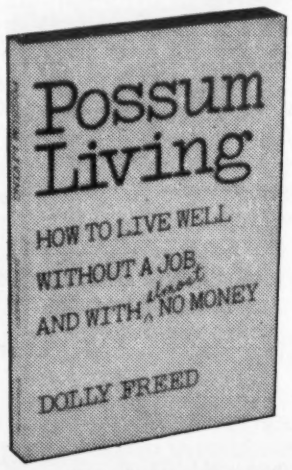
Possum Living

Dolly Freed has published a "first of its kind." Her book is a top-flight guide to simple living that is wonderfully written, explains the basic concept and speaks from personal experience.

I think she deserves folk hero status, the book is emotionally exciting and is very persuasive. It is worth noting that Ms. Freed is 19 years old, didn't go to high school and lives with her father (he is an important figure who detective story readers will try to identify). It all takes place in Pennsylvania.

—Michael Phillips

Possum Living
(How to Live Well Without a Job and With Almost No Money)
Dolly Freed
1978; 176 pp.
$3.95 postpaid
from:
Universe Books
381 Park Ave. South
New York, NY 10016
or Whole Earth



Vacations, another common expenditure, are not required — our whole life is just one big vacation. We don't need to "get away from it all" because there's nothing we want to get away from.

Hobbies don't cost us much. Mine, birdwatching, requires a pair of binoculars and book for identifying them, but they both last for many years. We both have $17 running shoes, but they last pretty long. We bought a badminton set for $11 (listed under "Luxuries"), but that, too, should give us years of enjoyment.

Christmas doesn't exist for us. December 25 is just another day here. 'Tis the season to be greedy, ostentatious, treacly sentimental, frenzied, hysterical, morbidly drunk and suicidal, and we see no reason to pretend otherwise.

•

Owning your own home free and clear — that's the key to all the rest. Once you have your snug harbor, your safe base, all else comes easy. You can tell the rest of the world to go to hell if you want, once you own the roof over your head. I believe that some parents who are willing to scrimp and save to give their kid a college education would be doing the kid a better turn by giving him that money to buy a house instead. Once he realizes he doesn't have to worry about his future — once he has security and leisure to think about it, instead of having his future rammed down his throat — he'll make his own future.

•

Ordinary pump-air rifles or CO_2 rifles are efficient tools for getting pigeon meat. You don't have to own one yourself, for invariably some neighborhood kid will. Tell him you like pigeons, and he gets to gratify his killer instinct, guilt-free, and you get that good meat. Everyone's happy but the pigeons.

We haven't tried it ourselves, but I've read of people scattering liquor-soaked bread, and gathering up the pigeons when they get too drunk to fly. Often at night we planned to do this but then next morning we'd find there wasn't any liquor left.

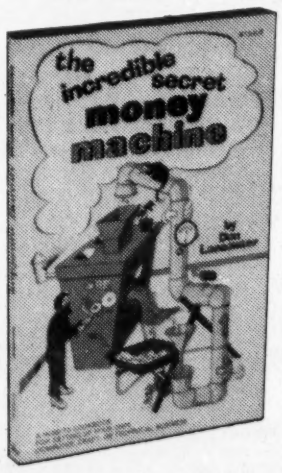
People who raise pigeons as a hobby often simply destroy unsatisfactory birds (such as homing birds that take too long to come home). If you ask these people they might either give them to you or sell them for a nominal price. These birds are referred to as culls.

The Incredible Secret Money Machine

For seven years I have actively advised and observed over 400 small businesses. This is the book that would have been helpful to nearly all of them. There is nothing comparable in wisdom, wit and genuine experience that I've seen in writing. On pages 5 & 6, he tells whether the book is for you: it is if you are in business "on a total lifestyle basis." "You want to stay in control" of your business, you are doing it, "so . . . (you) can continue doing what you like in the direction you want to go. . ." and your business is intended to be "gentle on yourself, gentle on people and gentle on the environment." Out of hundreds of books I've read on small business practices, this is the front runner by a large distance. It's fun to read and exciting.

—Michael Phillips
[Suggested by Seren Bach]

The Incredible Secret Money Machine
(A How-to Cookbook for Setting Up Your Own Computer, Craft or Technical Business)
Don Lancaster
1978; 159 pp.
$5.95 postpaid
from:
Howard W. Sams & Co., Inc.
4300 W. 62nd St.
Indianapolis, IN 46268
or Whole Earth



Having enough advance financing for your money machine is about the *worst* possible thing you can do and is almost certain to scuttle the whole machine.

A glib but accurate reason is that if you have the money, you are only going to spend it. And spend it on things that are totally unnecessary and in ways that will commit you down the road to even higher future costs. For your money machine to work, you have to start out scared, lean, and hungry. Such frivolities as food, clothing, and shelter should be totally forgotten in getting your money machine started.

There are lots of good reasons for studiously avoiding excess money when you start your money machine. It's real difficult for any beginner to increase the amount of money he is handling by more than 20% or so a year without starting to do stupid things with it or worrying too much about it.

•

If a person seeks you out, he has made an ego decision that he will defend. Should he buy from you, he will defend this decision, even if what he bought doesn't meet his needs. No way will he ever admit he got taken.

Oppositely, if a person feels he was "sold" something, he will easily find minor and even unreasonable faults with it to vent his displeasure.

•

When people tell you things, always assume that the exact opposite is a distinct possibility and hedge yourself accordingly.

•

Find out everything you can about possible antagonists, detractors, or competitors of any form. Anticipate what they are going to do and then completely change the rules of the game to something they simply won't understand.

•

Be hardnosed to freeloaders — if someone is using up more of your time, energy, or money than you'd like, tell them to shove off, walk away, ridicule them, or give them a dose of incompetence.

•

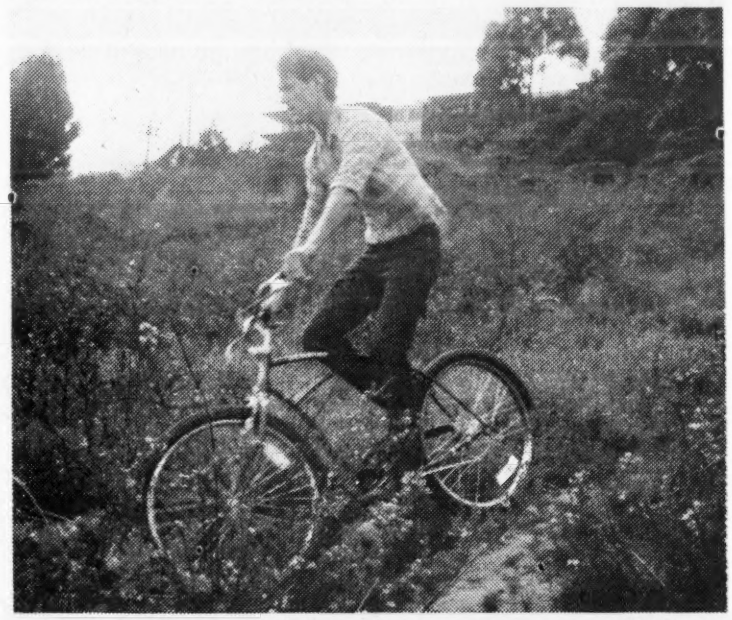
Screw off a lot — Go for a bicycle ride. Daydream. Go back to bed. Shoot pool. These are the times when things jell, when problems solve themselves, when new ideas happen.

•

The way around the copyright protection dilemma is to make your product so low in cost that no one can afford to duplicate it on their own in small quantities. A $4 to $9 technical paperback is unlikely to get widely copied. The same stuff in a $40 hardback book is almost certain to, particularly if it's required for a university course. A $5 cassette software program won't get ripped off because it takes more than $5 worth of hassle to duplicate a single copy.

Nomadics

The Schwinn Klunker - 5



It appears that the 26-inch balloon-tired, multi-geared bicycle — commonly known as a clunker or cruiser — is well on its way to repeating the pattern established ten years ago by the 20-inch motocross bikes for kids: a product that begins selling first in California and within two years has caught on nation-wide. (I hope all of you out there realize this is due more to corporate marketing strategies than to any inherent grooviness of Californians.) Schwinn took a back seat on the motocross fad, but definitely has the jump in the clunkers.

Last September, Schwinn took their good old heavy-frame messenger boy bike (which you can see being ridden maniacally in the heart of any large American city) and added a Shimano Positron II 5-speed derailleur, a drum brake in the rear, and side-pull brakes in the front. They christened it the Klunker-5 and expected to sell 3,000 of them in the remaining months of 1978. Those bikes were gone in a week and a half, and Schwinn has been behind ever since. They have sold 4,900 of them in the first four months of this year, with all but a thousand of these going to the California market.

So the answer to the question: Where can I buy a clunker bike, turns out to be easy — at your local Schwinn bike shop. The K-5 is selling now for $172.95, which is a good price. A local bike shop had been buying the frame and forks from Schwinn and building up their own version earlier last year, but those were running $245 (mass production works).

The weakest part of the design is the front forks, which are not tubular, and can break from heavy riding. This is something Schwinn can easily remedy, and hopefully they will. I have also made a few modifications to the K-5 I have recently purchased, to wit: a 20-inch twelve-gauge seat post (needed by anyone over 6' 0"), a quick-release seat post clamp, Sure Stop pads for the front brakes, and Oakley hand grips (not pictured).

In the meantime, custom-made cruiser bikes costing as much as $1,000 continue to be made here in northern California. The extra money definitely puts you in another league — light-weight, incredibly strong, and parts that will last a life time. For most people interested in off-road bike travel, the K-5 is a good place to start.

—Richard Nilsen

The Schwinn Klunker-5
$172.95
from:
Your local Schwinn dealer

Flying with a bicycle

With gasoline becoming increasingly scarce and expensive, and the potential of jumbo jets to haul a lot of people for a little money beginning to be realized, air travel is becoming a better bargain all the time. Bringing a bicycle along is both easy and inexpensive. Requirements vary from airline to airline and get particularly intricate when flying to foreign countries, so by all means check the details first. Also, what follows does not apply to tandem bicycles, which exceed the length restrictions and have to be shipped as freight.

On all the airlines I checked with, a bicycle can count as one of the two pieces of luggage you are allowed to check with your ticket. This even included overseas flights with Pan Am. If you have two pieces of baggage and a bike, the flat rate for domestic travel is $12. The handlebars have to be rotated 90 degrees, and some carriers require the pedals be removed as well, both simple operations. American sells a heavy gauge plastic cover for bicycles at airports for $3.50 (and they will also haul a tandem on domestic flights for a $24 flat rate), Delta requires cardboard containers for bikes, but supplies them for the same $12 rate. Containers on some other airlines are optional, but it does not appear that any of them will guarantee against damage unless the bike is in a container. Overseas prices are higher, but not bad, e.g., $46 will get a bike from San Francisco to Paris.

—Richard Nilsen

A Handbook for Bicycle Activists

Just that, and a good useful one too. How to fight the good fight.

—J. Baldwin

A Handbook for Bicycle Activists
Ernest Del, Lawrence C. Moss, Thomas Z. Reicher
1976; 79 pp.
$2.95 postpaid

from:
Stanford Environmental Law Society
Stanford Law School
Stanford, CA 94305

U.S. Cavalry Store

One of the more fascinating catalogs you can get. It's designed for people in, around, and after the tanks part of the U.S. Army — a bizarre mix of wonderful military boots and clothing, grotesque military memorabilia and decorations, kids' stuff, and oddments findable nowhere else. There must be similar catalogs aimed at other military branches and services. Would someone tell us about them please?

—SB

U.S. Cavalry Store, Inc.
Catalog from:
U.S. Cavalry Store, Inc.
1375 North Wilson Rd.
Radcliff, KY 40160

U.S. Cavalry Buckle. Our largest selling one. Finest quality, heavy-duty brass plated pewter. Fits on the Army specification black garrison belt. EO1-1057, $5.00 postpaid.

HEAVY DUTY BOOT ZIPPERS. Lace one time for all time — then in and out in a flash. 9, 10, 11 or 12 eyelets to fit all boots. Kit contains two black Scovil Zippers with eyelets and two rayon boot laces. Specify number of eyelets.
E03-3030 ..... $6.75 Postpaid

Genuine Vietnam Boots (MIL-B-43154). Brand new government issue. Proven durability under the most rugged conditions. Finest specifications and workmanship. Steel shank included. Nylon webbing on side and top. Panama sole resists clogging. Saran ventilating insole inserts. The greatest boot for work, hiking, motorcycling. Sizes 6-13 in regular or wide widths. No half sizes. EO3-1014, $29.50 postpaid.

AMC Field Guide to Trail Building and Maintenance

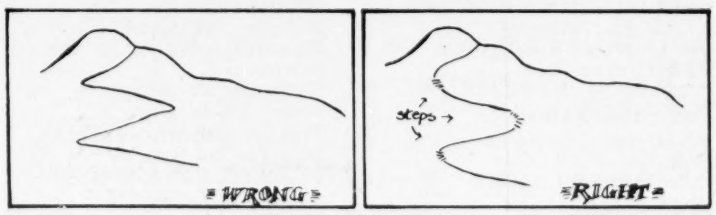
Proudman draws heavily on the experience accumulated by members of the Appalachian Mountain Club trail crew, a group that's been dealing effectively with trail problems in New Hampshire's rugged but heavily travelled White Mountains for over fifty years. He covers the nuts-and-bolts of trail design and construction, from initial planning to the legal brushcutting involved in getting permission to route a trail across private land. Best of all, he stresses the use of natural materials for any necessary reconstruction, and the use of non-motorized tools; neatly avoiding the tendency of some agencies to turn popular footways into little Interstates.

The text is nicely illustrated with black and white photographs, and some fine pen-and-ink drawings. While the book was written with Eastern backcountry in mind, most of the techniques described apply equally well to other parts of the country. Required reading for anyone involved in the care and feeding of a foot trail, and recommended for anyone else who wants to understand what they're hiking on.

—Jon Vara

AMC Field Guide to Trail Building and Maintenance
Robert D. Proudman
1977; 193 pp.
$4.95 postpaid

from:
Appalachian Mtn. Club Books
5 Joy St.
Boston, MA 02108
or Whole Earth

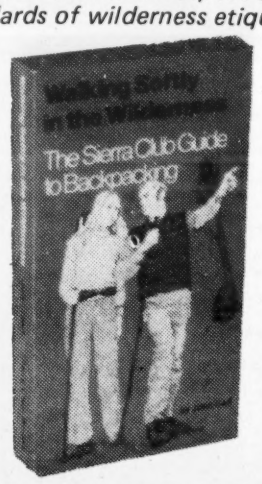


Left, *narrow switchbacks are prone to shortcutting.*
Right, *wide turns fortified with steps prevent shortcutting.*

Walking Softly in the Wilderness

Typical, competent, and very up-to-date with respect to equipment and newly emerging standards of wilderness etiquette.

—J. Baldwin



Walking Softly in the Wilderness
John Hart
1977; 436 pp.
$5.95 postpaid

from:
Sierra Club Books
Box 7959
San Francisco, CA 94120
or Whole Earth

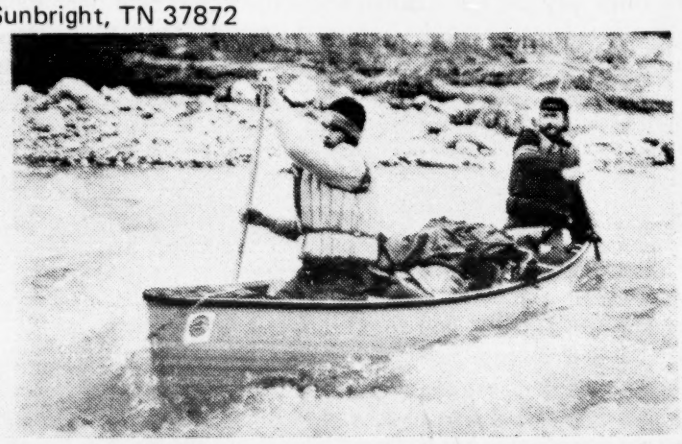
What about a fire on grass? If, for some reason, you must make one, never light it on the living surface of the ground. Rather, cut out a square of sod and set it aside. In the hole you have created, light the fire, preferably without a lining of stones. Then, when the fire is dead out, replace the sod. The same technique will work in soft ground without sod.

Good new canoe

Blue Hole Canoes have added a fine cargo-carrying expedition boat to their line of nearly indestructible agile craft. The incredible durability of the Blue Hole Canoe makes it a lot safer on a remote voyage. Our personal Blue Hole has been superior in every way.

—J. Baldwin

Catalog
from:
Blue Hole Canoe Co.
Sunbright, TN 37872



People's Folk Dance Directory

A nearly complete world guide to folkdancing groups, the **People's Folk Dance Directory** *is every bit as reliable as it claims to be, and put out by people who are fun to dance with, too. I just used it on a three-month long bike tour in the Northeast and Ontario and found it my most reliable source of companionship, entertainment, and a place to crash afterwards. Buy it, read it, and relax yo' regional prejudices.*

—James Mershon

People's Folk Dance Directory
John Steele
1978; 65 pp.
$1.75 postpaid

from:
People's Folk Dance Directory
P.O. Box 8575
Austin, TX 78712

Western Massachusetts

Ladies Chain Contra Dance Band
New England contras & squares. Dance various times and places. Call for info. $2.00.

Bonnie Blair
57 Crescent Street
Northampton, MA 01060
413/586-2826

Heather McLaughlin
Jackson Hill Road
Levetett, MA 01054
413/367-2096

•

London

Cecil Sharpe House FD
Cecil Sharpe House, 2 Regents Park Road, London.

Dancing here several times a week — English CD, Morris, etc. Also there is a shop and library with zillions of books, records, music, instruments for "English speaking" dances (Scottish, English, Irish, New England).

•

Things for Sale — General

The Folk Motif

Folkdance footwear and clothing; folk art books; records, etc. c/o Bora & Margarita Gajicki, 2752 E. Broadway, Long Beach, CA 90803. 213/439-7380. Free brochure.

Thracian Bizarre

Folkdance footwear; Romanian blouses & skirts, Yugoslavian & Romanian costumes.
Illia & Maria Kaloyanova, 32 Walnut Crescent, Montclair, NJ 07042. 201/744-6096.

Worldwide Folk Dance House

Records, costumes, hats, wigs, vests, opanci.
P.O. Box 8033, Columbus, OH 43201. 614/262-2777.

Magazines

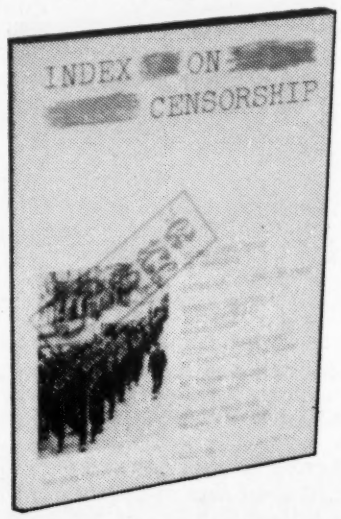
Content Style Consequence

Index on Censorship

Even if you're sure the news is being censored, you're a prisoner of your own particular brand of paranoid speculation unless you know exactly what is being left out. This magazine reports on stories not covered and why they weren't from all parts of the world and political spectrum. The style is calm, careful, well-researched, and horrifying.

—Anne Herbert

Index on Censorship
Michael Scammell, Ed.
$16.00/yr., 6 issues
from:
The Fund for
Free Expression
205 E. 42nd St.
New York, NY 10017



The most influencial theoretical writing on the Cambodian society and its problems was the Ph.D. thesis submitted by Khieu Samphan (now Cambodian Head of State) to the Faculty of Law and Economics of the University of Paris in 1959. In his thesis, *The Economy of Cambodia and its Problems of Industrialisation,* Khieu Samphan argues that the only way the Cambodian economy could be independent and self-sufficient would be to cut itself off from the international economy for a period of time. Because Phnom Penh and other provincial cities owed their expansion to French colonialism, Chinese commerce and the bureaucracy, they were a drain on national wealth. Khieu Samphan estimated that over 80 per cent of city dwellers were unproductive and only served the elite. He proposed to transfer them to productive sectors of the economy, basically to agriculture, and form them into cooperatives. His main argument is that only by expanding agricultural production can the base be provided for industrialisation. —Lek Hor Tan
Cambodia's total revolution

•

The worst known massacre of civilians in the guerrilla war occurred in May 1978 in the Gutu TTL, south-east of Salisbury. According to the military communique, 50 "curfew breakers" died when a "routine security forces patrol" stumbled on a meeting organised by guerrillas. The communique said that the patrol opened fire, killing one guerrilla who was addressing the meeting.

According to eye-witnesses (see Paul Ellman's article *The Guardian,* 18 May, 1978) 94 civilians were killed and there was no "crossfire" as mentioned in the communique. According to reports reaching me in London, the weekend after the incident, the Rhodesian security authorities learnt that the weekly Salisbury paper *The Sunday Mail* was about to publish an account similar to the one printed in *The Guardian* and elsewhere abroad. The head of the Rhodesian Security forces, General Peter Walls, flew immediately by helicopter to Salisbury and, together with the Minister of Information, persuaded the editor of the *Mail* to drop his story.

Less than a month later, the worst ever attack on whites occurred, when 12 British missionaries were brutally murdered at the Elim Mission near the Mozambique border. Most British newspapers splashed the story on their front pages and for the first time in the six-year-old war, television cameras were allowed to film the corpses of white victims of the conflict.

—Rhodesia's Propaganda War

Improved magazine access

Inevitably we printed some errors last issue in the voluminous price-and-access section of the 378 magazines reviewed. Researcher Patty Phelan inherited most of them from **Ulrich's International Periodicals Directory** *at the library, which lags rather far behind inflation.*

Worst of all, we way overpriced those priceless publications, **Science** *and* **Nature**, *that so dominated our reviewers' lists. You can get* **Science** *weekly for $34/yr., instead of $65, and* **Nature** *weekly from England for $52/yr., instead of $165.*

Gossip: **Esquire Fortnightly** *did a similar what-magazines-do-you-read feature in their June 5 number. Among the Theodore Whites, James Micheners, and Phil Donahues, I was asked what I read. After reciting my list I asked the interviewer if she wanted access on those periodicals. "Thanks, don't need it," she said. "We're not including access." "Why not? Surely you can afford it." "We're not a service publication like you are."*

—SB

American Naturalist
$30/yr., 6 issues
Univ. of Chicago Press
5801 Ellis Ave.
Chicago, IL 60637

Anthropological Journal of Canada
$9/yr., 4 issues
1575 Forlan Dr.
Ottawa, Ont.
Canada, K2C OR8

Building & Construction Cost Data
$19.50 annual report
R.S. Means Co.
100 Construction Plaza
Duxbury, MA 02332

Cascade
$10/yr., 10 issues
1 West Fifth Ave.
Box 1492
Eugene, OR 97440

Country Journal
$12/yr., 12 issues
Box 1225
Brattleboro, VT 05301

Current Anthropology
$25/yr., 5 issues
Univ. of Chicago Press
5801 Ellis Ave.
Chicago, IL 60637

Cultural Correspondence
$7.50/yr., 4 issues
c/o Dorrwar Bookstore
224 Thayer St.
Providence, RI 02906

Fox River Patriot
$7.50/yr., 24 issues
Box 7
Princeton, WI 54968

High Times
$16/yr., 12 issues
Box 386
Cooper Station
New York, NY 10003

Hustler
$22/yr., 12 issues
Box 67068
Los Angeles, CA 90067

Int'l. Journal of General Systems
$86/yr. (4 issues)
Gordon and Breach
Science Pub., Ltd.
42 William IV St.
London WC2 England

Journal of Communication
$18/yr., 4 issues
Intercommunication Assn.
Annenberg School of Communications
Box 13358
Philadelphia, PA 19101

Locus
$9/yr., 12 issues
Box 3938
San Francisco, CA 94119

Mariah/Outside
$12/yr., 6 issues
Box 2690
Boulder, CO 80322

Mass Media Booknotes
$5/yr., 12 issues
Dept. of Radio, Television, Film
Temple University
Philadelphia, PA 19122

Nature
$52/yr., 52 issues
Macmillan Journals, Ltd.
Brunel Rd.
Basingstoke, Hants
R621 2XS, UK

The Neighborhood Works
$25/yr., 24 issues
570 West Randolph St.
Chicago, IL 60606

Not Man Apart
$15/yr., 24 issues
Friends of the Earth
124 Spear St.
San Francisco, CA 94105

Off Our Backs
$6/yr., 11 issues
1724 20th St. N.W.
Washington, D.C. 20009

Parabola
$12/yr., 4 issues
Box 165
Brooklyn, NY 11202

Saturday Review
$16/yr., 22 issues
James Broodwater Pub.
1290 Ave. of the Americas
New York, NY 10019

Science
$34/yr., 52 issues
1515 Massachusetts Ave. NW
Washington, D.C. 20005

Studies in Short Fiction
$11/yr., 4 issues
Newberry College
Newberry, SC 29108

Synthese
$60.25 per volume
Reidel Publishing Co.
Lincoln Building
160 Old Derby St.
Hingham, MA 02043

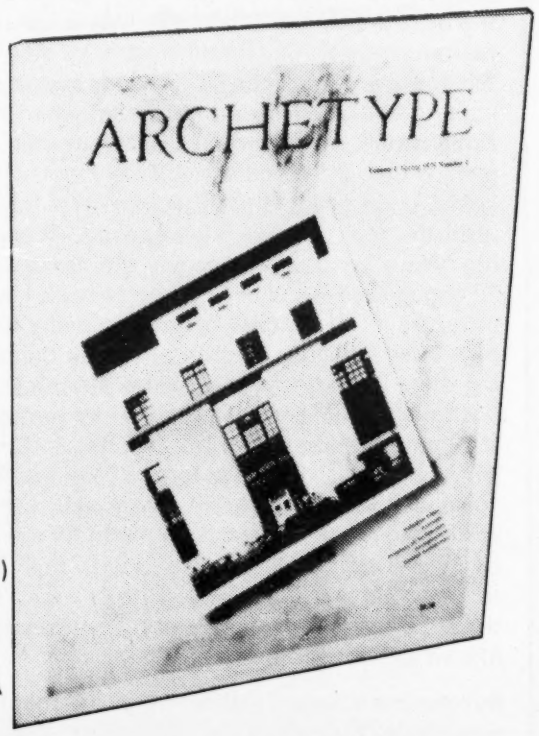
Teachers & Writers Magazine
$5/yr., 3 issues
84 Fifth Ave.
New York, NY 10011

New magazines

New magazines are sometimes better and sometimes worse than what they become.

Archetype

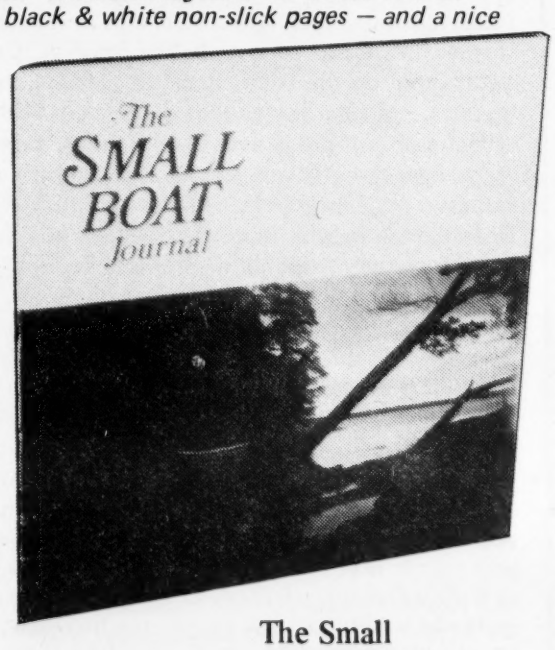
Good old **AD** *(Architectural Design) from England has lost its coverage of the creative fringe in recent years with no one else picking up the banner.* **Archetype**, *a brand new tabloid quarterly from San Francisco, clearly has the banner in its grasp. Vol. 1, No. 1 has features on Ecotopian architecture as reported in U.S. national security files, on genital architecture, and on saving San Francisco's art deco post office, Rincon Annex.*



Archetype
$8/yr. (4 issues)
$2.50, single copy)
from:
Archetype
25 Osgood Place
San Francisco, CA
94133

The Small Boat Journal

Beloved **National Fisherman** *has divided into itself and* **The Small Boat Journal.** *The new magazine has a nice format — 11 inches square, black & white non-slick pages — and a nice subject: everything that floats under about 30 feet. If editor David Getchall keeps the quality evident in the pilot edition, he's got a winner. So do you with his monthly if you get your boating enjoyment from being on the water rather than from spending lots of money.*



The Small Boat Journal
David R. Getchall, Ed.
$12/yr.
(12 issues)
from:
The Small Boat Journal
21 Elm Street
Camden, ME
04843

Travel & Leisure
$18/yr., 12 issues
1350 Ave. of the Americas
New York, NY 10019

Vital
$9/yr., 6 issues
1201 Kirk Street
Elk Grove Village, IL 60007

Wilson Quarterly
$12/yr., 4 issues
Box 2956
Boulder, CO 80322

Orca

Slick, color, quarterly, **Orca** *purveys information and inspiration around America's favorite totem, the whales and dolphins. Page 9 has a full-page color photo of Bowhead whales fucking, leading one to wonder what orgasm is like in a brain that large.*

Orca
(Marine Mammals and Man)
Randall L. Eaton, Ed.
$15.00/yr. (4 issues, incl. membership)
$10.00/yr. (sub. only)
from:
Orca Society
University of Washington
DB-10
Seattle, WA 98105

Cosmic Search

A magazine on the Search for Extra-Terrestrial Intelligence (SETI) seems like a small-audience item. But suppose SETI succeeds — extra-terrestrial intelligence could comprise a pretty large audience. **Cosmic Search** *has a hobbyist look — its survival will likely depend on the breadth and depth of the hobby itself.*

$12/yr. (6 issues)
($2.50, single copy)
from:
Cosmic Search Magazine
Box 293
Delaware, OH 43015

Zero

Why are magazines from religious groups so often classy? Because they can attract and keep good artists attentive to a higher calling than big bucks. (Political groups sometimes attract artists, but they can't keep them.) This premier issue from the Los Angeles Buddhists has an all-star cast — Leonard Cohane, Ram Dass, Joshu Sasaki Roshi, Kenneth Rexroth, Allen Ginsberg, John Ashbury, Gary Snyder, Robert Thurman.

All in all, a blockbuster of fine clarity, recalling two remarks. One from Ginsberg in **Zero**'s *promo — "Subtle understanding of glad emptiness our lives, American Earthly saves us from Apocalyptic pain, the 'Suffering of Suffering,' so a XXth Century Literature of Dharma Bums and Ladies & Gentlemen rises in Capitals & Provinces, exemplified herein* **Zero.**" *The other from Gregory Bateson in conversation, "The problem with Christianity is that it's a slave religion. Part of the attraction of Buddhism for me is that it was founded and sustained by aristocrats."*

—SB

Zero
Eric Lerner, Ed.
$6.00/yr (2 issues)
($4.00 single copy)
from:
Zero
2255 W. 25th St.
Los Angeles, CA 90018

Content Style Consequence

Manchester Guardian Weekly

What you missed is the only good English-language newsweekly, which is the Manchester Guardian Weekly. It is 24 pages/week with heavy emphasis on international news. The articles are culled from the previous week's editions of **The Guardian, Le Monde** *and* **The Washington Post,** *so that France and the U.S. are well covered. As a British paper,* **The Guardian** *pays special attention to nations in the Commonwealth and in the Common Market.*

—Avery Hart

Manchester Guardian Weekly
$38/yr., 52 issues, airmail

from:
Manchester Guardian Weekly
20 East 53rd St.
New York, NY 10022

To generalise: the moneyed South, the affluent Midlands and the shires are very sure. The great urban conurbations in the regions have withheld decisive judgment. It is hard to resist the conclusion that the have-nots, the have-littles and the have-problems bent only slightly to the wind of change whilst the have-plentys and the want-mores were eager to clip along with the Conservatives.

That is a warning and a challenge to the new Government. But for the moment they, and their leader, have a triumph to savour. Mrs. Thatcher evokes powerful devotion and equally powerful antipathy. But her place in history is booked already.

•

"What really robbed the *yakuza* of their aura of chivalry was not so much their involvement with the Right as their own changing values. The underworld has lost its moral sense, the rules of the game have been swept aside, and all that's left is chaos," I was told, with a hint of bitterness in his voice, by someone I shall call Yamamoto so as not to reveal his identity.

•

For Yamamoto, whose views are largely corroborated by the police, the Japanese underworld is evolving in two ways. First, there is the emergence of a new generation of younger criminals, who form gangs known as *gurantai* (literally: "those who have turned out badly"), which flout all the rules of the game. Made up of people born after the war, these gangs have carved themselves a niche in the gambling and prostitution business, and whether they like it or not the *yakuza* have to have dealings with them.

The second development has been the increasingly important place occupied by a number of individual gangs, seven in all, who now control the whole of the Japanese underworld. The feeling in Osaka is that "if gangland has been thrown off balance, it is because of the Yamaguchigumi's hegemonism."

•

By 1943, Bertolt Brecht also was the subject of a bulky FBI file, compiled by direct surveillance, wiretapping, the use of informants and a monitoring of his mail. The file was never used for any legal action, but it is now providing an ambivalently happy hunting ground for Brecht scholars.

My 2¢ on Magazines

by Roger E. Hyde

When I am getting into something I expect to be really important — something that's going to crawl into me and stay there — I get a creepy, prickly feeling all over. I felt that way when my Grandparents died and we went through things, their secrets, their treasures — we didn't know what would be in the next drawer or envelope — maybe something that would rearrange everything in our lives — (it didn't happen). I have felt that way when the **CQ** arrived, that it was a revolution waiting to explode in my face; that when I sat down with it I might very well stand up a different man. That has happened; though not quite as fiercely as I sometimes feared it could. I have hidden **CQ**s from myself for a few hours or until the next day when I felt ready. It has happened watching "Nova" on PBS (especially the shows "Washoe" and "Tongue Tied"). When **Life** came back I wanted it to revolutionize me (I suppose because so many have claimed to have been benignly revolutionized by the old version); nothing there yet but I keep looking. I thought **Omni** might do it but I never even bought no. 3. They were plainly trying to stir up all the fascinations of Science and Fantasy and maybe get a synthetic substitute for the fascinations of Religion: methadone for agnosticism. Very sad. I think **Fine Woodworking** could get through to me in its way, but they seem to always spoil their own mood with their adamant refusal to postpone practicalities even for a page. I like **Trains** but the ads are sickly escapist and the articles are all so sad (it's like whale watching).

But the main reason I am writing is to mention that I get fully swept away by certain old periodicals. Magazines like **Architectural Forum** or **Pencil Points** showing all of the latest designs and features of '20s and '30s construction. You can sit down with a ten year set of these magazines and transport yourself to a different world. And it is a better head-washing experience in a few hours than anything I know. I've had a roughly similar feeling from certain movies and novels where it was almost a surprise to be me again at the end. It's the details that do the trick: little ads, letters, short news bits, layout . . . all the things that get left out if a summary or critique or anthology ever comes along. Some of these magazines can displace you to a whole different system of values in art, design, craftsmanship, ethics, morality . . . . Read **British Printer** from the 1880s - '90s; it's much richer in texture than fictional or dramatic sources. Go through the **Illustrated London News** of say a hundred or a hundred and twenty years ago. Read these things seriously: feel the flesh in your throat swell up over their contented prejudices and bigotries; feel their sweet amazement in getting mail from California in three weeks; feel really afraid of savages and of going 30 miles an hour. People take trips to shift their perspective and so feel all their surroundings more acutely. You can't buy a ticket to a place that will give you the kind of shift these old magazines can. And the best part is that in a good library (at a major university or a major municipal research library) you can find this stuff hidden all over the place. It's like an Easter egg hunt. I just wander around and amaze myself. Of course, you can set out to find the "known" quantities too. You might think you know what to expect from a Hearst paper in 1935 or an old **Harper's Weekly** with a Thomas Nast cartoon on the front — but don't count on it. Going back to the original source with all the ads and texture is the difference between seeing the drawing of a pineapple in the dictionary and actually eating one. All of us in this media generation seem to have a great appetite for vicarious experience, but we are cheating ourselves waiting for the docudrama on TV. If you can accept the format change you can get experiences undreamt of in the ABC Programming Department. ■

ROBERT HEINLEIN

Science fiction writer; author of Stranger In a Strange Land, The Moon Is a Harsh Mistress, The Green Hills of Earth, I Will Fear No Evil, *etc., etc., etc.*

When your letter arrived, I was deep in writing a new novel; when your deadline passed I was still working on it — and I stop in the middle of a novel only to act as pallbearer.

This novel had the special purpose of finding out whether or not I could still write fiction after brain surgery. It is now finished and sold; I have proved that a hole in the head is no handicap to a science fiction writer.

I was interested in your list because it is so much like mine in some ways — not necessarily the same journals but serving me in much the same way, given that my work as a writer is not identical with yours.

News

Wall Street Journal***
Santa Cruz Sentinel**
U.S. News & World Report**
$22/yr. (52 issues), Box 2627, Boulder, CO 80321

News of my business

Locus
$9/yr. (12 issues), Box 3938, San Francisco, CA 94119
SFWA Forum
SFWA Bulletin
$10/yr. (5 issues) Science Fiction Writers of America, 131½ Bromont, Sylmar, CA 91342
Author's League Bulletin
Analog Science Fiction/Science Fact
$10/yr. (12 issues), Conde Nast Pub., Inc. 350 Madison Ave., New York, NY 10017
Fantasy & Science Fiction
$12.50/yr. (12 issues), Box 56, Cornwall, CT 06753
Galaxy
$7.50/yr. (6 issues) 720 White Plains Rd., Scarsdale, NY 10583
Galileo
$7.50/yr. (4 issues), Avenue Victor Hugo Pub. 339 Newbury St., Boston, MA 02115
Isaac Asimov's Science Fiction Magazine
$5.40/yr. (4 issues), Davis Publications 229 Park Ave. S., New York, NY 10003
Omni
$24/yr. (12 issues), 155 Allen Blvd., Farmingdale, NY 11735

etc. — I read them all (fast!) in order to see what is being sold.

Science

Scientific American
Science
Astronomy
$15/yr. (12 issues) 411 E. Mason St., 6th Floor, Milwaukee, WI 53202

Spaceflight

Astronautics & Aeronautics
$38/yr. (11 issues) 1290 Ave. of the Americas, New York, NY 10019
Insight
L-5 News
$12/yr. (12 issues), 1620 N. Park, Tucson, AZ 85719
Sabre
Journal of the Astronautical Sciences
$30/yr. (4 issues), American Astronautical Society 6060 Duke St., Alexandria, VA 22304
Spaceflight (B.I.S.)
$20/yr. (12 issues), British Interplanetary Society 12 Bessborough Gardens, London SW1 V2JJ, England

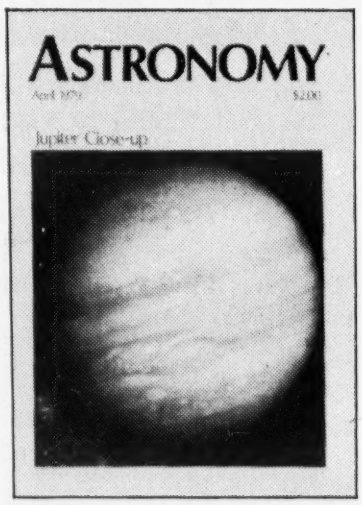
Military

Army
$10/yr. (12 issues) 1529 18th St., N.W., Washington, D.C. 20036
Navy Times
$18/yr. (52 issues) 475 School St., S.W., Washington, D.C. 20024
Air Force Times
$18/yr. (52 issues) 475 School St., S.W., Washington, D.C. 20024
U.S. Naval Institute Proceedings
$15/yr. (12 issues) U.S. Naval Institute, Annapolis, MD 21402
Shipmate (USNA Alumni magazine)
The Retired Officer
$3.50/yr. (12 issues) 1625 Eye St. N.W., Washington, D.C. 20006

Oddments

The Futurist
Quest
Transfusion
$24/yr. (6 issues), American Assn. of Blood Banks 227 S. 6th St., Philadelphia, PA 19105
American Association of Blood Banks Bulletin
Journal of the Royal Horticultural Society
Starlog
$11.98/yr. (8 issues), 475 Park Ave. S., New York, NY 10016
Cosmic Search
$12/yr. (6 issues) Box 293, Delaware, OH 43015
Inquiry
$12/yr. (4 issues), Box 142, Boston, MA 02113

More than a dozen others come into the house that Ginny uses rather than I: mining journals, financial journals, stock market news letters, several concerning horticulture, several concerning HiFi systems & music. About fifteen years ago I quit paying attention to money; it is time consuming and there didn't seem to be any need for more than one expert in the house. I read such things when she tells me to. In a similar fashion I lean on her in chemistry and biochemistry.



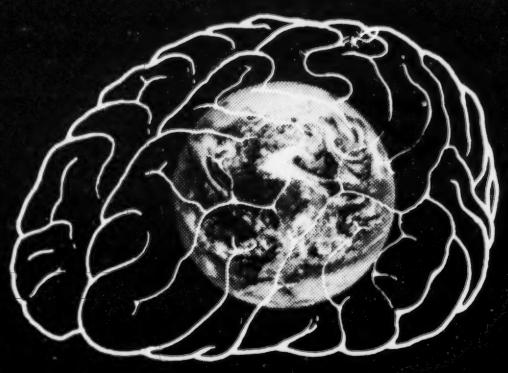
With rare exceptions I do not read thoroughly the journals I use; I skim them, clip them, and file the clips by categories that I have worked out over the years as being useful for my writing. A few I keep full files on — but space does not permit for most; 90% are skimmed, clipped, and sent to the dump.

What we do have (not covered by your project) is a large and carefully organized general reference library on almost any subject you can name — to which we add steadily and lavishly. Not oftener than twice a year do I call the University library or Lick; the answer is almost always in the house.

Box 428, Sausalito, CA 94965

Tuning In To WARC

(World Administrative Radio Conference)



BY ROBERT HORVITZ

It is obvious, however, that the influence of this invention over the political, commercial, and social relations of the people of this widely-extended country, looking to nothing beyond, will, in the event of success, of itself amount to a revolution unsurpassed in moral grandeur by any discovery that has been made in the arts and sciences, from the most distant period to which authentic history extends to the present day. With the means of almost instantaneous communication of intelligence between the most distant points of the country, and simultaneously between any given number of intermediate points which this invention contemplates, space will be, to all practical purposes of information, completely annihilated . . . The citizen will be invested with, and reduce to daily and familiar use, an approach to the HIGH ATTRIBUTE OF UBIQUITY, in a degree that the human mind, until recently, has hardly dared to contemplate seriously as belonging to human agency, from an instinctive feeling of religious reverence and reserve on a power of such awful grandeur.

So wrote the Commerce Committee of the U.S. House of Representatives in 1838, one of my all-time favorite quotes, describing not radio, but Samuel Morse's telegraph. Their words are relevant here nonetheless, because they were obviously looking past the actual device to what it foreshadowed. So was Morse: even before the Congress got around to appropriating funds for the construction of his first inter-city telegraph line, he succeeded in sending telegraph messages across a river, using the river water itself as the conductor (1842). That was another important step in the progression that would eventually free the "almost instantaneous communication of intelligence" from the constraints of distance and terrain, open up the radio frequency spectrum, and bring us ever closer to the realization of the Commerce Committee's original vision. Electromagnetism continues to press us toward UBIQUITY.

—Robert Horvitz

Beginning on September 24, 1979, and continuing for ten weeks, representatives of the 154 nations that make up the International Telecommunication Union (ITU)will meet in Geneva "to review and, where necessary, revise" the international radio regulations. Known formally as the 1979 General World Administrative Radio Conference (informally as GWARC or WARC '79), fifteen hundred delegates are expected to attend, making it one of the largest inter-governmental conferences ever held. The United States has been preparing for it for over five years. The long lead time and the conference's size indicate its importance: decisions reached at WARC '79 will, at the very least, establish the basic framework of radio frequency use, worldwide, for the remainder of the century. Beyond that, the delegates will discuss proposals for redistributing portions of the radio spectrum, for allotting satellite positions in the geostationary orbit, for ending the "radio war" currently going on in the short wave bands, for restricting or promoting the use of remote-sensing satellites, etc. In other words, WARC will be the occasion for debating the principles that should govern the flow of information between nations – and turning those principles into international law. This article, focussing on WARC '79, begins a special section devoted to the visible politics of the invisible spectrum.

OUR "WINDOW" ON THE WORLD, the visible portion of the electromagnetic spectrum, is a narrow band of energy frequencies between about 4 and 8 x 10^{14} cycles/second – a single "octave." Human ingenuity has dramatically widened this window over the past century through the invention of devices that can generate and detect energies far outside the optical band. We tend to take this development for granted now – or else condemn it as "unnatural" – but it is actually an evolutionary marvel: as big a leap beyond animal eyesight as animal eyesight is beyond mere phototropism in plants. And it happened so quickly – within our grandparents', our parents' and our own lifetimes.

Today, probably the most valuable region of the expanded spectrum is what we call the radio frequencies (RF). This includes all frequencies below the optical and near-infrared bands (lower than 3 x 10^{12} cycles per second, or, in radio jargon, lower than 3000 GHz). It's valuable because we've found so many ways to use it: in navigation (location-finding, airport landing and harbor guidance, etc.), remote sensing (radar, radio astronomy, earth resources satellites, burglar alarms, etc.), remote control (TV channel-changers, spacecraft telecommand, guided missiles, etc.), and most especially in communications (broadcasting, intercity microwave, mobile radiotelephony, satellite relays, CB, etc.). Many activities that involve radio would be riskier, more expensive, more difficult, or totally impossible without it. In fact, we're almost as dependent on radio now as we are on fossil fuels – and are becoming more so, as radio-communication proves to be a fuel-saving substitute for some other forms of communication, like mail and personal travel.

As a resource, radio is almost too good to be true. It's undepletable – no amount of usage today means we'll have any less tomorrow (although it's use does consume electric power – it's not free). It's versatile, as even my short list above shows. It's relatively cheap, abundant and widely available.

As for safety, even though research into radio's effect on living tissue is just beginning, and microwaves have gotten everyone scared, it is possible to say right now that most radio fields are much, much weaker than the natural radiations of sunlight and heat, and most organisms are "transparent" at most radio frequencies.[1]

In principle, we have access to more radio energy than we could ever hope to use. In practice, however, use has to be restricted because of the problem of interference. Interference obliterates the information carried by radio waves and makes it impossible to pick out the signals you want to receive from among all the others that are in the air at the same time. Thus, it is possible for large numbers of people to use the radio spectrum simultaneously only if they all abide by certain rules and their radio behavior is carefully orchestrated. Experience has shown that spectrum use is not spontaneously self-regulating. Some generally-recognized authority must regulate access to and use of the radio spectrum.

A History Lesson (Be Patient)

The regulation of radio began at the international level, because the first radio service, wireless telegraphy, was primarily used outside of national boundaries – between ships at sea and between ships and shore stations. Interestingly enough, the original motive behind regulation was not the control of interference, but the control of Marconi's Wireless Telegraph and Signal Company:

> Early in 1902 . . . Prince Henry of Prussia, brother of the German Kaiser, was returning to Germany, in the S.S. *Deutschland,* after a visit to the United States. Soon after sailing, he desired to send President Roosevelt a radio message thanking him for the numerous honors and courtesies which had been accorded him. The *Deutschland* transmitted this message to the Marconi station at Nantucket, but that station refused to accept it because the ship was fitted with Slaby-Arco radio equipment. The irate Prince brought the matter to the attention of his brother. Kaiser Wilhelm thereupon instructed his government to initiate action in an attempt to establish international control over radio communications.[2]

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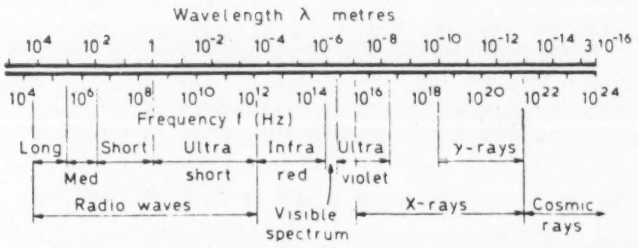


Hz = cycles per second = "hertz"
kHz = 1,000 Hz = "kilohertz"
MHz = 1,000,000 Hz = "megahertz"
GHz = 1,000,000,000 Hz = "gigahertz"

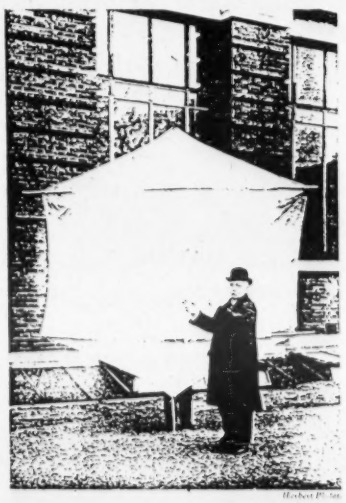
Band number	Band designation	Frequency range	Typical uses
4	VLF (very low frequency)	3 to 30 kHz	Long-range point-to-point communication
5	LF (low frequency)	30 to 300 kHz	Long- and medium-range point-to-point communication, radionavigation, aeronautical mobile, etc.
6	MF (medium frequency)	300 to 3000 kHz	Medium- and short-range communication: AM broadcasting, international distress and disaster, aeronautical mobile, marine radiophone, amateur, etc.
7	HF (high frequency)	3 to 30 MHz	Medium- and long-range communication: international broadcasting (short wave), international point-to-point, air-ground, ship-shore, space research, radio astronomy, CB, etc.
8	VHF (very high frequency)	30 to 300 MHz	Short-range line-of-sight communication, over-horizon "scatter" communication: FM broadcasting, VHF television, space tracking and telemetry, land mobile, amateur, etc.
9	UHF (ultra high frequency)	300 to 3000 MHz	Short-range communication, microwave relay, UHF television, land mobile, weather satellites, radar, radio astronomy, etc.
10	SHF (super high frequency)	3 to 30 GHz	Microwave relay, communications satellites, radio astronomy, deep space research & telemetry, aeronautical radionavigation, etc.
11	EHF (extremely high frequency)	30 to 300 GHz	Microwave relay, radar, space research, radionavigation, radio astronomy, experimental amateur, etc.

More than a bruised royal ego was involved here. It was widely appreciated that control over radio was tantamount to control over naval intelligence, and that, in turn, was tantamount to control of the seas. The Marconi company, based in England, was regarded by many as a dangerous new dimension of British imperialism, and its policy of refusing to sell its equipment to merchant mariners (instead, it offered a lease which provided for a Marconi employee to send and receive all messages) did not dispel the impression that it was interested in more than its clients' money.[3]

Eight countries, including the United States, responded to the Kaiser's invitation and met in Berlin in 1903 for the first international radio conference. The result was a "protocol" stating the few points that a majority of the participants could agree on, to serve as the basis for another conference in 1906. Although the protocol contained the requirement that all coastal stations handle wireless messages to and from any ship, it did not have the force of law, and both England and Italy entered "reservations" rejecting this point out of sympathy with Marconi. England further maintained that it lacked jurisdiction over Marconi activities outside of its borders. (Ironically, at the conference, England also proposed that the Morse Code equivalent of "CQ" be used as the international distress call!)[4]

Thirty countries attended the follow-up conference in 1906 and approved an expanded version of the 1903 protocol. They also adopted "SOS" as the international distress call and established the basic format for radio regulation that still exists today:

- A "Convention," which serves as the fundamental charter for regulation. It is ratified as a treaty by participating nations and can only be changed by a conference of "plenipotentiaries";
- A series of "Regulations," the actual rules of radio usage, which are also ratified as a treaty. They can only be changed by "Administrative Conferences," scheduled as the need arises;
- An "International Bureau," affiliated with the International Telegraphic Bureau, to perform administrative duties and collect and disseminate information about radio theory and practice (this Bureau has since been elaborated into several functional units);
- Certain key principles expressed in the Convention and the Regulations, such as avoiding interference between stations; assigning different frequencies to different kinds of stations; nations being responsible for seeing that all stations within their borders, in their coastal waters and on ships flying their flag



This is the kite used to receive the first transatlantic radio message – the letter "S," three dots, sent at regular intervals from Poldhu, England to St. John's Newfoundland, on December 12, 1901 to Guglielmo Marconi. The man holding the kite is G.S. Kemp, Marconi's assistant, who verified receipt of the signal.

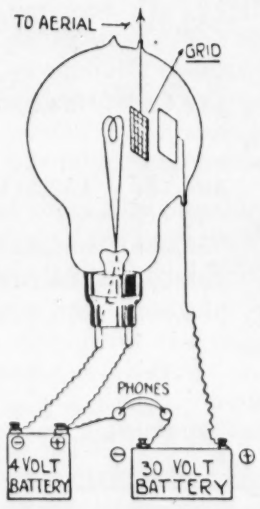
obey the Radio Regulations; notifying other nations of the location, power, frequency, hours, etc., of all transmitters within their own jurisdiction; resolving disputes by arbitration rather than by decision of the International Bureau; etc.[5]

The United States pushed very hard to get the other participants to accept the principle of "unrestricted interchange of communication between all stations." At the start of the conference, it was virtually alone in supporting this notion, but by the end it had convinced a large majority of the others. Twenty-one countries signed a "Supplementary Agreement" moving in that direction.[6]

I've dwelt so long on these first two international conferences because they show that many of the most important ingredients of international radio policy, ingredients that are shaping WARC '79, were present from the very start. Most nations still fear dependence on foreign suppliers of essential communication services. Nations still lodge reservations whenever they find their national interests incompatible with the majority's decision. The United States is still the primary advocate of the "free flow of information" principle. Like England, we still find it convenient to deny responsibility for the activities of American-based communications companies beyond our borders – even while shaping our official policy to further those activities. And most discouraging of all, radio's inherently supra-national character, its indifference to political boundaries, which in an ideal world would be perceived as a force for global unification, in this world is more often perceived negatively as undermining national sovereignty.

The ITU

The International Radio Telegraphic Union (IRTU) was created by the signing of the 1906 Convention. As radio grew, the IRTU grew. It eventually merged with the older International Telegraphic Union (started in 1865), and the two became the International Telecommunication Union in 1932. In 1947, the ITU became a specialized agency of the United Nations. Today, with 154 member governments, its jurisdiction is extremely large, including all international communication by cable, radio-wave and satellite, as well as all non-communication uses of the radio frequency spectrum and all communication uses of the geostationary orbit. Although the ITU does not have direct authority over intra-national radio, most nations try to dovetail their domestic policies with the ITU's, to avoid creating interference with their neighbors in areas near their common border.[7]



Lee deForest's invention of the "Audion" tube was as important to the history of radio as anything Marconi did. The Audion made amplification possible, and the coding of a sound signal onto a "carrier" frequency easy. Patent conflicts between deForest and Marconi almost paralyzed radio development, but World War I came along – just in time – and forced a resolution.

An amusing but still unfulfilled fantasy – receiving lunch by radio. Also unfulfilled was the fear of amateur radio's "doom" (see writing along left margin of cover). At the time, the fear was very real: the first commercial radio station, WEAF, owned and operated by giant AT&T, had just gone on the air the previous summer and changed everyone's thinking about the future of broadcasting. But not only have the amateurs not been squeezed off the air, they have their own satellite system (see AMSAT, p. 113) and a hefty increase in frequency allocation written into the American proposals for WARC '79. AT&T left the radio business in 1926. The editor of Radio News, *Hugo Gernsback, is immortalized in the annual science fiction award, the "Hugo."*

WARC

Following the pattern established in 1906, the Radio Regulations are modified every so often by Administrative Conferences. Nowadays there are two kinds (three, if you count Regional Conferences). Specialized WARCs are held every few years to revise the rules of a particular service or group of services – like the Maritime WARC in 1974 or the Aeronautical-Mobile WARC in 1978. These have limited agendas and in a strict sense only produce recommendations for rule changes to be considered at General WARCs (in a practical sense, however, their recommendations are rarely denied). General WARCs are held less frequently (the last one before this year's was in 1959 and the next isn't expected until 1999). These have broad mandates, to enable the delegates to assess proposed changes in all sections of the Regulations, and to address more fundamental questions of policy and future needs.

This year's WARC promises to be especially interesting because of all the changes that have occurred since the last such gathering. Think how much has changed: twenty years ago, when the present Regulations were adopted, the launch of the first geosynchronous satellite was still years away (1963); solid state electronics had not yet opened up its cornucopia of new signal modulation techniques; computers were still an infinitesimal part of the world's information traffic; and about half of the ITU's present membership had either not yet come into being (were still colonies or parts of other nations), or they were too new to have developed their own policy positions. That last difference is probably the most significant of all, since the ITU operates on a one-nation, one-vote basis: in theory, Rwanda's vote counts as much as ours.

In other words, between the last General WARC and this year's, the voting majority in the ITU has shifted from the overdeveloped to the underdeveloped nations, with Africa representing the largest geographical bloc. This is causing a certain degree of apprehension in many capitals, including our own (we have more at stake than anybody else), and leading many observers to anticipate some substantial shifts in policy.

In the rest of this article I'm going to try to give you an overview of some of the broader issues that are likely to come up at WARC. Nobody really knows what will happen for sure, since the agenda can be added to at the Conference and, as Glen Robinson, head of the U.S. delegation, told me, a lot depends on who specifically attends. But before getting down to the nitty-gritty, I'm afraid I have to subject you to a bit more "background."

Spectrum management

Nothing was said in the 1906 agreements about licensing radio transmitters, the fundamental tool of modern regulation. That was an idea whose time had not yet come. When it did come (in the United States, 1912) licensing was understood to be the prerogative of individual nations. However, licensing did little to contain the explosive growth of radio, and as the airwaves got more and more crowded, as interference got more serious, and as new radio services were introduced (broadcasting, transoceanic radio-telephony, etc.), "spectrum management" emerged as the single most important task of international regulation.

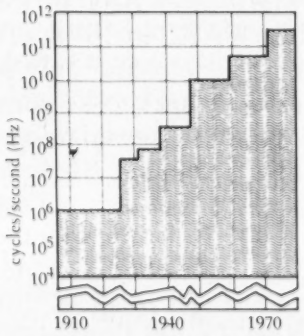
Spectrum management as we currently know it can be said to have begun in 1927, when the old Radio Union accepted an American proposal to divide the spectrum into separate bands, each reserved for a single use. This scheme was formalized as the worldwide Table of Allocations. After a long phase-in period, individual countries were left with the freedom to assign individual channels to stations within their boundaries, but only within the general band structure approved internationally. When a domestic assignment was made (a license issued), the government would inform the International Bureau, to secure a right of non-interference for its licensee. If the Bureau found that the new licensee would probably interfere with a station in another country, it informed the government of that fact. Although the Bureau could not require that an alternative assignment be made, the Union held to the principle that the first registrant for a frequency had priority

The radio spectrum has been "crowded" since the 1920s, but it hasn't become an impossible situation yet because radio receivers have steadily become more selective and sensitive, because transmitters have been designed to be less wasteful of power and frequencies, and mainly because the number of useable frequencies has increased almost a million-fold since the early days of radio. All of the increase has been due to expansion into higher frequencies, with higher information-carrying capacities. This chart shows the growth of the international table of frequency allocations from 1906 onward. WARC '79 may raise the upper limit again, to include the laser frequencies used in fiber-optical communications.

Data for this chart comes from Haffner, Victor, "Appendix B: Radio-Frequency Planning," in *Global Communications in the Space Age: Toward a New ITU* (see note 9).

Data points:

1906:	10^6	cycles/sec.
1927:	3×10^7	"
1932:	6×10^7	"
1938:	2×10^8	"
1947:	1.05×10^{10}	"
1959:	4×10^{10}	"
1971:	2.75×10^{11}	"



Most users of the radio spectrum are neither commercial broadcasters nor giant common carriers like ITT, RCA, AT&T, etc. The overwhelming majority, at least in this country, are categorized as "safety and special services." In 1976 (the most recent figures I could get), the FCC reported that there were 6,806,777 authorized stations in this category, operating a total of 27,486,139 transmitters. You get a clear picture of how rapidly radio use has been expanding by comparing these figures to what they were ten years before: 1,533,379 stations operating 5,615,953 transmitters in 1966 – more than a four-fold increase in one decade – much of it due to the CB fad. Breaking down the figures into service groups:

Service	Authorized stations 1976	1966
Aviation (Civil Air Patrol, airport, aircraft, radionavigation, etc.)	188,536	105,133
Marine (shipboard, coastal, marine radar, etc.)	262,616	123,076
Public safety (police, fire, emergency, forestry service, highway maintenance, local gov't., etc.)	118,625	54,839
Industrial (oil-drilling, power-line & telephone maintenance, manufacturing, construction, etc.)	304,753	152,315
Land transportation (taxi dispatch, railroad, intercity bus, etc.)	25,248	16,914
Citizens' band (CB)	795,502	5,614,201
Amateur	283,083	270,562
Disaster (mainly the Radio Amateur Civil Emergency Service)	9,715	15,038

(Data from *Federal Communications Commission Annual Reports*, 1966 and 1976)

Electro-magnetic weather

The National Bureau of Standards operates a radio station, WWV, in Fort Collins, Colorado, that reports on conditions affecting radio wave propagation. At 14 minutes after every hour, it gives forecasts on propagation patterns in the North Atlantic area. The announcements have a standard form: "The radio propagation quality forecast at (time) is (excellent, very good, good, fair-to-good, fair, poor-to-fair, poor, very poor, useless). Current geomagnetic activity is (quiet, unsettled, or disturbed)." This is followed by a repeated, synoptic version using the following code:

Current conditions:		Propagation forecast:	
Whiskey	= Disturbed	One	= Useless
Uniform	= Unsettled	Two	= Very poor
November	= Normal	Three	= Poor
		Four	= Poor-to-fair
		Five	= Fair
		Six	= Fair-to-good
		Seven	= Good
		Eight	= Very good
		Nine	= Excellent

The forecast period, incidentally, is for the six hours following the announcement, so if you hear "Uniform Five," that means current geomagnetic conditions are unsettled and will be fair during the next six hours.

At 18 minutes after every hour, WWV broadcasts brief "geo-alerts" about solar activity and geomagnetic events. These are essentially real-time bulletins, and are followed by a summary of significant events during the previous 24 hours.

WWV broadcasts 24 hours a day at 2500, 5000, 10,000, and 15,000 KHz. If you can't receive it, you can call (303) 499-7111 and hear on the telephone what's being sent out over the air. All calls are automatically limited to three minutes (so you can't hear both propagation reports and geo-alerts in one call), and are *not* toll free. If you call ahead of the proper time (14 minutes after the hour), you'll just hear time-code pulses – not very interesting.

over all subsequent registrants; more generally, by being the first to register the use of a frequency, a nation thereby acquired a permanent priority over other nations in the use of that frequency. This became known as the "first come, first served" principle.

> This approach appears to have worked reasonably well until the 40s. At that time, some countries began to register many assignments which were known to be fictitious. [In 1947] an attempt was made to terminate the rights acquired by previous registration, develop an equitable plan for allotment of channels to countries, and have the plan maintained by an International Frequency Registration Board (IFRB) with substantial administrative powers.[8]

But there was considerable resistance to the idea of a pre-planned, nation-by-nation allotment of channels, and although the IFRB did come into being, it was given only limited powers. The 1959 WARC voted to strengthen the IFRB, but that provoked a few nations to propose abolishing it altogether in 1965. It was only saved by the protests of developing nations, who depend on it for technical advice.[9] The IFRB now oversees the Master International Frequency Register (it receives about 2,000 new frequency assignment notices a week); studies current spectrum use and makes recommendations about using the spectrum more effectively; investigates complaints about interference; and gives technical advice to nations that request it. Any attempt at WARC '79 to strengthen international spectrum management and planning would very likely involve strengthening the IFRB.

As new radio services continued to proliferate, it became impossible to grant an exclusive band to each one. The sharing of bands by different services is now quite common. And as countries evolved to different levels of radio development, they started using different technologies for similar ends: most of our intercity voice communication relies on the microwave bands, but most Third World countries use the HF (high frequency) bands for that. Moreover, the introduction of communication satellites in the 60s has added a whole new level of complexity, since their huge downlink beams are superimposed geographically on hundreds of terrestrial radio fields. Thus, what began as a neat, uniform system of exclusive band allocations is now a Byzantine system of shared band allocations varying from region to region and from Earth to space around the globe.

Spectrum management is hideously complex today, comprehensible only to specialists. Its complexity has had the unfortunate effect of hiding the social implications of allocation decisions behind a dense veil of electrical engineering detail. The public, even public officials, are often frozen out of the decision-making process. We can thank the Third World countries, who are less spellbound and/or alienated by the technology, for bringing social issues back onto center stage.[10]

The U.S. Proposals

Most of the estimated 3,500 pages of proposals that will be discussed at WARC are concerned with changes in the Table of Allocations: increasing or decreasing the number of frequencies that one service or another can use, changing exclusive bands to shared bands or vice versa, etc. Some of the changes the U.S. is proposing in this area are:

- To increase the AM broadcasting band to make room for a few hundred new stations (the upper limit of the band would be raised from 1605 to 1860 kHz);
- To increase sharing between land mobile systems and television broadcasting in the UHF band (the FCC has already started allowing land mobile users to take over unclaimed channels originally set aside for television stations, channels 14 - 69);
- To double the allocation for satellite down-links around 12 GHz (in anticipation of a rapid growth in domestic satellite systems during the 80s);
- To increase the exclusive allocation for amateurs (hams) by nearly fifty percent;
- And to increase the number of channels used for international broadcasting (see "Short-wave" below).[11]

Compared with the rumors circulating about what other countries might propose, the U.S. proposals are quite dull. In fact, it seems to be a deliberate strategy on the U.S.'s part to hunker down and con-

centrate on specific, concrete, technical issues. Part of this is undoubtedly pragmatic: it is easier to reach agreement on those kinds of things than on broad, novel principles, and any change that results is quite limited in impact. But part of it seems to be an if-we-ignore-what-we-don't-want-to-face-maybe-it'll-just-go-away attitude. When I remarked to one of my information sources that the U.S. seemed to be extremely well-prepared – but prepared for the wrong conference, he laughed and said he felt that way sometimes, too. He was part of the team that drafted the U.S. proposals.

Equal Rights vs. Squatter's Rights

Dissatisfaction with the "first come, first served" principle has been gaining momentum in recent years and is sure to be an important factor in the discussions at WARC. In fact, the principle has already been superceded in a few areas, and the real questions now are where else will it give way, and what will it give way to.

The main virtue of the principle is its practicality. It is responsive to actual demand (fictitious registration notwithstanding), it can be applied to any part of the spectrum, and it eliminates the need for long-range forecasting of spectrum use and politically-controversial allotment formulas.

Its main disadvantage is that it systematically rewards the nations with the largest appetite for radio frequencies. When I say "disadvantage," I mean from the perspective of most of the world's peoples; what has been a disadvantage to them has been our great blessing. Heather Hudson recently cited an estimate that the "first come, first served" principle has resulted in ten percent of the world's population controlling ninety percent of the radio spectrum.[12] A more equitable distribution of this global resource is one of the main goals being sought by the Third World under the rubric of a "new world information order," and their strategy has been to challenge and replace policies that reinforce the gap between the "haves" and the "have-nots."

One of their most significant successes occurred at the 1971 WARC for Space Telecommunications, which adopted a resolution stating:

> That all countries have equal rights in the use of both the radio frequencies allocated to various space radiocommunication services and the geostationary satellite orbit for these services . . . [Therefore] the registration with the ITU of frequency assignments for space radiocommunication services and their use should not provide any permanent priority for any individual country or groups of countries and should not create an obstacle to the establishment of space systems by other countries . . .[13]

Although these sentiments were put on the record – and they represent a real departure from past practice – no plan for allotting space frequencies or orbital slots was adopted. However, in 1974, at the Maritime WARC, similar sentiments did lead to the adoption of a plan for maritime services. According to the **Report of the United States Delegation,**

> A principal theme at the Conference was "equal rights," meaning equal rights for old and new users of the radio spectrum. The procedure adopted by the Conference, under which future allotments for coast stations are to enjoy the same status as existing ones, abolished the existing system which affords seniority to allotments/assignments on the basis of a date associated with initial frequency use.[14]

On this occasion, the U.S. entered a reservation – the first really significant one it had ever made.[15]

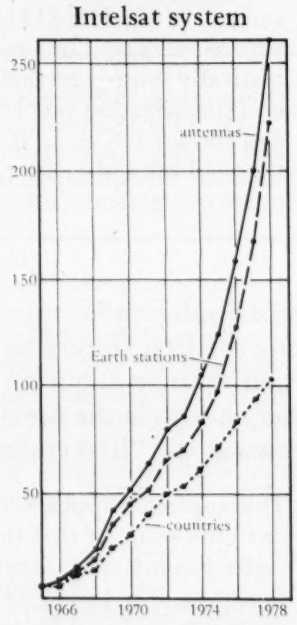
And more recently, at the 1977 WARC for Broadcasting-Satellites, a plan similar to the maritime plan was adopted for satellites over Regions 1 and 3. The U.S. successfully resisted the adoption of the plan in Region 2. (The ITU defines Africa, Europe and Soviet Asia as Region 1; the rest of Asia, Australia and the South Pacific as Region 3; North and South America as Region 2.)[16]

> The fact that no plan for Region 2 was adopted at this conference was due largely to the opposition to such a plan by the United States, Canada, and Brazil. The view of these nations was that any plan adopted many years before the first satellite was to be designed and operated could neither be based on the actual characteristics of satellites that will be possible in future years,

INTELSAT

Year	Total No. of half-circuits	Annual space segment utilization charge (in U.S. dollars)
1965	150	$32,000
1966	172	20,000
1967	688	20,000
1968	1,142	20,000
1969	2,835	20,000
1970	4,529	20,000
1971	5,822	15,000
1972	7,497	12,960
1973	9,814	11,160
1974	11,507	9,000
1975	13,369	8,460
1976	16,520	8,280
1977	20,206	7,380
1978		6,840
1979		5,760

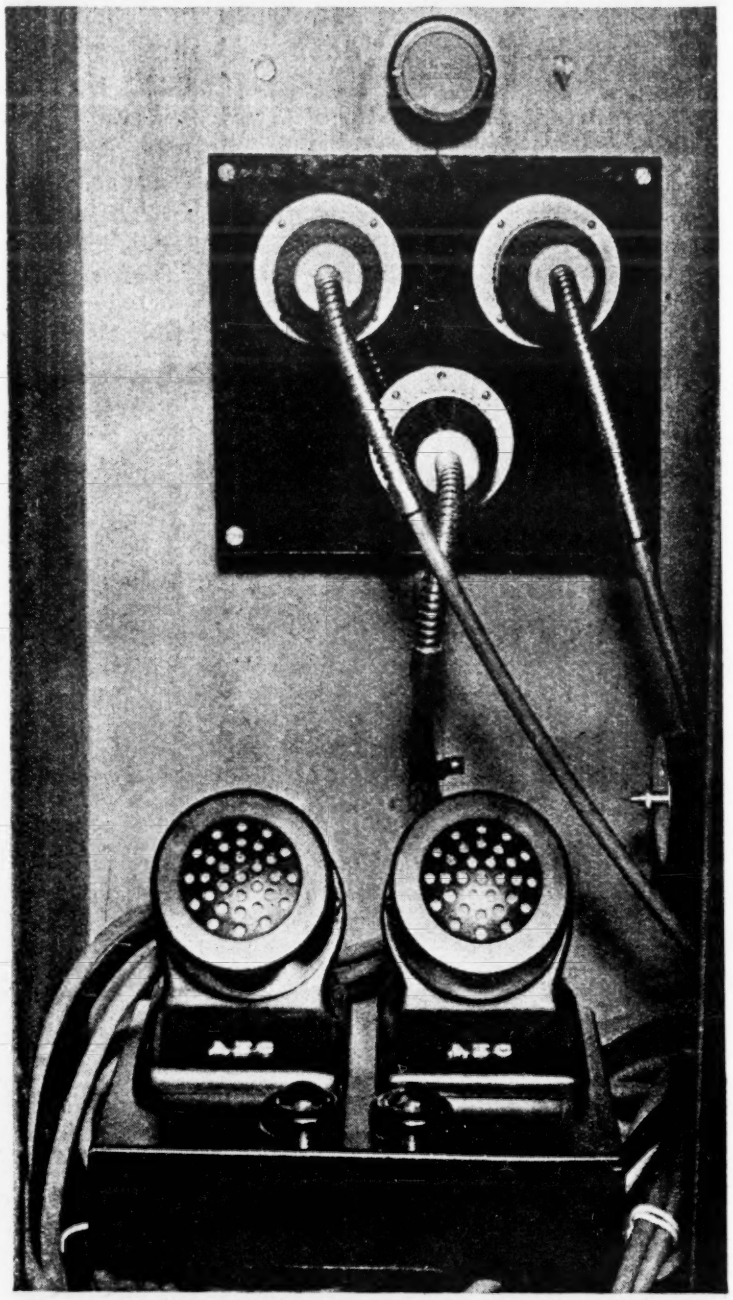
Growth of the Intelsat system

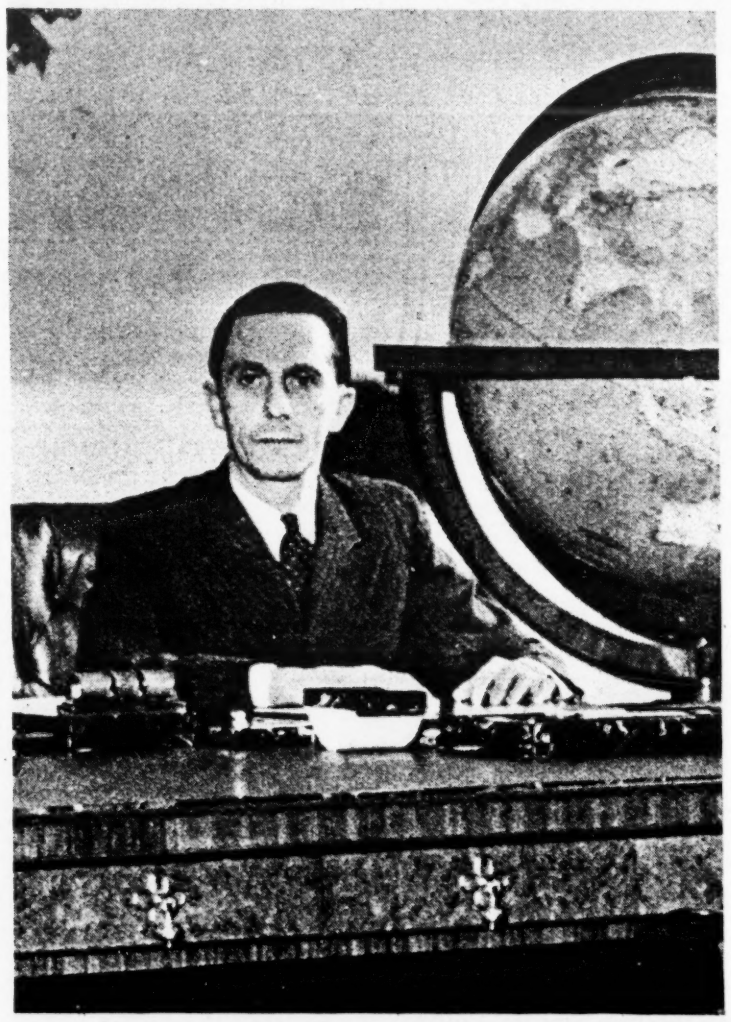


"The INTELSAT system currently carries approximately 60 percent of the world's transoceanic telecommunications traffic, with most of the remaining 40 percent being served by submarine cables in the Atlantic and Pacific Ocean regions."

– From statement by the Director General of the International Telecommunications Satellite Organization (INTELSAT), Santiago Astrain, before the Subcommittee on Space Science and Applications, U.S. House of Representatives, May 16, 1978.

Half of all interconnections through INTELSAT either originate or terminate within the U.S. This does not include use of the system by U.S.-based businesses between points abroad.





Reich Minister of the Propaganda Ministry Dr. Joseph Goebbels.

Berlin, 1941. "The touch of a lever suffices and with the aid of this up-to-date technical installation Dr. Goebbels can immediately switch off the programme of the broadcasting stations in Greater Germany and himself speak through this microphone to all listeners." From Hitler's Wartime Picture Magazine - Signal.

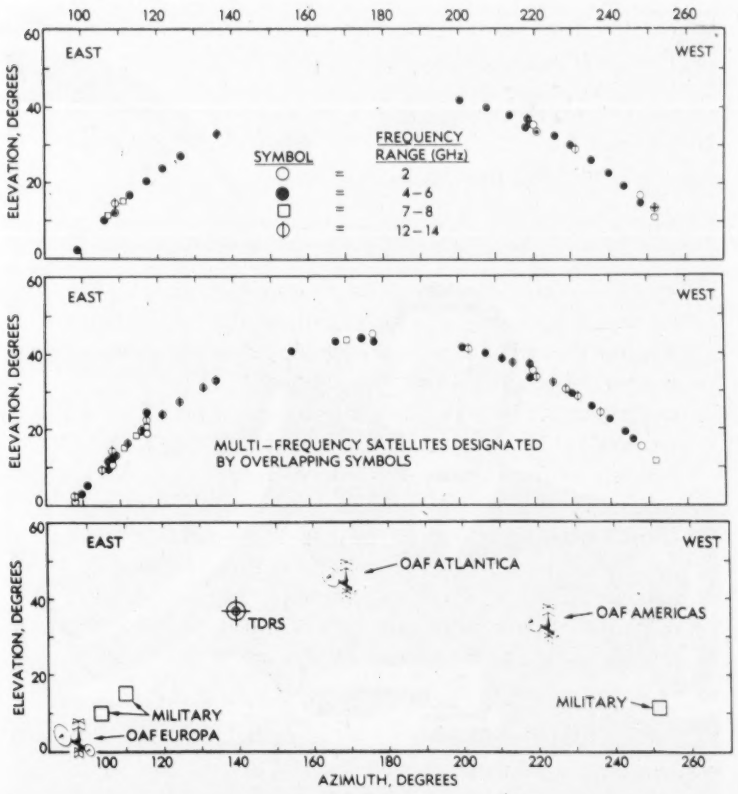
> nor could it accurately reflect the actual communication requirements that would then exist. Therefore, any such plan would likely be inefficient and wasteful of the orbit and spectrum.[17]

These criticisms may be good spectrum management, but they completely miss the point. According to Anthony Rutkowski:

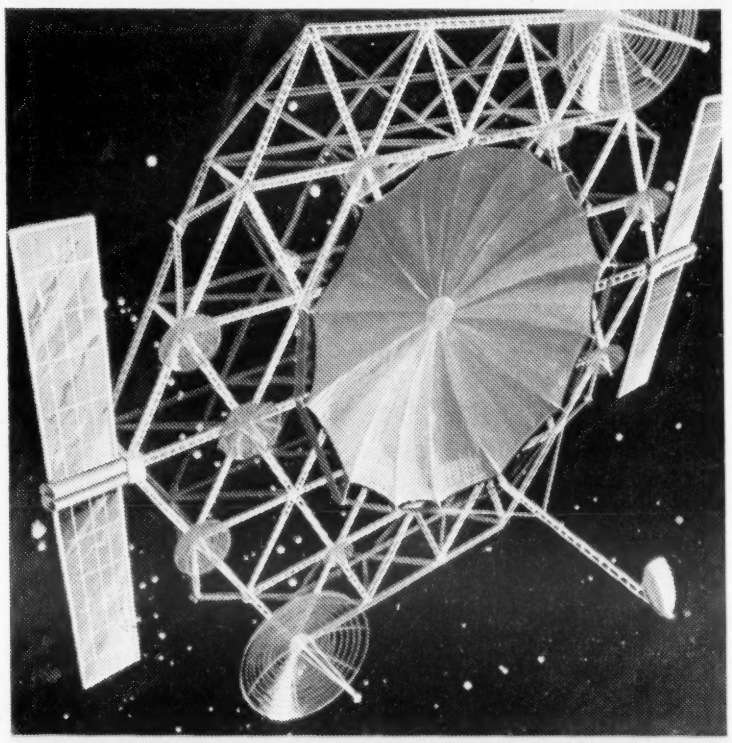
> . . . it was not so much a matter of allocating resources which motivated the preponderance of nations to adopt a plan, as it was the desire to control the ingress of broadcasting from a foreign country. Efforts in other forums such as the [United Nations Committee on the Peaceful Uses of Outer Space] had failed to produce a consensus resolution regarding the principle of prior consent for one state to broadcast into the territory of another . . . The very nature of the *a priori* plans adopted by the 1977 Broadcasting-Satellite Conference preclude the undesired state action – allotments to satellites to broadcast to a geographical area were granted only to the nation having legal jurisdiction over that area.[18]

(The principle of "prior consent" has to do with the right of a nation to control the flow of information into and out of its territory. The U.S. has opposed this notion at every opportunity, as it implies government control over all transborder information flow. The U.S. position has led many countries to envision the prospect of American media conglomerates putting up satellites and bombarding them with "Laverne and Shirley" reruns – because that, along with journalistic freedom, is implied by the "free flow of information" principle we advocate. More on this later. At any rate, the Broadcasting-Satellite plan is a perfect example of the growing tendency to use ITU technical rule-making to achieve political goals that have not been achieved in more conventionally political forums. We're apt to see this trend continued at WARC '79, for although the ITU has no jurisdiction over the content of the media it regulates, it can make certain kinds of communication difficult or impossible by the way it regulates these media.)

Since the early 70s, the U.S. government has taken the attitude that since satellite technology is evolving so rapidly, the best thing they could do is just stay out of the way and let open-market competition sort things out. This is reflected in the FCC's policy of granting licenses to pretty much any domestic satellite system that someone wants to start – as long as it



Orbital crowding is a growing problem. According to Walter Morgan (Comsat Laboratories' Senior Staff Scientist), and many others as well, the "inevitable" solution is the Orbiting Antenna Farm (OAF), a large grid on which many satellites can be mounted. The platform would not only save orbital space, it would save money, because "housekeeping" systems – solar power panels, attitude controls, propulsion, telemetry – could be shared between satellites, eliminating the need for each to have its own separate capacity. These charts illustrate the kind of consolidation possible with OAFs. The first shows the positions of the satellites in the geostationary arc visible from Clarksburg, Maryland in 1977. The second shows the same portion of the arc as it will appear in 1981, with currently planned systems in operation. The third shows how the arc could look if satellites were co-mounted on a few OAFs. (These charts are taken from Dr. Morgan's article, "Space Stations," in the April, 1978 Satellite Communications. *The "artist's conception" of an OAF is also from* Satellite Communications*; it appeared on the January, 1978 cover.)*



doesn't interfere with a previously-licensed system ("first come, first served"). If we were to agree to a regional plan that allotted a specific number of channels to each country, this so-called "open skies" policy would have to be curtailed – if only because the orbital arc that our proliferating domestic systems are claiming is shared with the other countries in the region, and our markets don't take their needs into consideration.

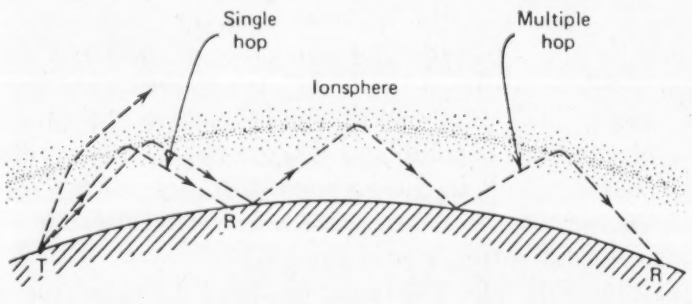
There is an obvious historical parallel to all this, in terrestrial broadcasting. During the 1920s, then Secretary of Commerce Herbert Hoover saw that broadcasting was in flux and he decided the best thing to do was to let open competition sort things out. The result was the capture of the powerful tool of broadcasting by commercial interests and the establishment of distribution patterns that have proven all but impossible to change through subsequent regulation. Belatedly, in the 1950s, the FCC decided that certain social needs were not being met by commercial broadcasting, and 242 TV channels were set aside for educational and non-commercial use – even though the commercial broadcasters protested that this was an inefficient use of the spectrum (the channels were not quickly claimed), it was "socialistic," and a dangerous precedent (if you give in to one group's request for channels, everybody'll want 'em).[19]

I suspect we'll eventually recognize the need for allotting satellite channels to fulfill social needs which market forces do not address, just as the Third World and the European countries presently argue. But for now, our commitment to unplanned development is preventing us from coming up with alternatives to the kind of proposals that we obviously find unacceptable – plans that appear to us as inefficient, socialistic, and dangerous precedents – but which actually apply our professed democratic ideals more directly than our own government's policies. It seems to me that if we want to preserve the option of demand-responsive, ad hoc development for satellite systems, we may have to abandon the principle of granting permanent priorities to the earliest registrants. By continuing to insist on the priority aspect of "first come, first served," we encourage not flexibility and experimentation, but claim staking. And if priority were not obtained automatically through the date of registration, goodness, we might actually have to discuss what our priorities are.

Short Wave

Aside from satellites, another area likely to see movement toward the adoption of a channel allotment plan is international broadcasting in the short wave (HF) bands. Ever since World War I, nations have used radio to transmit information to the residents of other nations (without their prior consent). Short wave lends itself perfectly to this task since its signals travel tremendous distances (by bounding off the ionosphere), yet are undetectable near the transmitter: you can have the station on your own soil and reach only foreign listeners.[20] In this country we don't pay much attention to international broadcasts – possibly because we're so saturated with our own media – but in countries without such abundance, short wave is often an important part of the informa-

Short wave (HF) transmission. T, transmitter; R, receiver.



tion diet – especially useful for keeping abreast of crisis situations, and for feedback on how your country's actions are perceived by others.

Among people I've talked to about short wave, but who've never listened to it themselves, I've found a surprising degree of chauvinism: why listen to all that foreign propaganda when our media is free to tell it like it really is? Well, with very few exceptions, I've found international broadcasts generally to be no more propagandistic than the network evening news on American TV. The "marketplace of ideas" is more of a reality internationally than it is in any one country, and competition does have the kind of disciplining effect that theory predicts: if you feel a particular station's reporting is unreliable or invalid, you have genuinely independent alternatives to turn to – many of them. And of course short wave is more than news. Like AM and FM, music is the principal programming material, and an evening of world music is enough to make returning to American Top-40 radio feel claustrophobic. International broadcasting obviously has an important role to play in pluralizing and integrating world culture, but at the moment, the field is in chaos and the situation is deteriorating year by year.

The short wave band is more than overflowing. The ITU's recommended capacity for international broadcasting is 9,900 daily frequency hours (the number of daily programming hours times the number of frequencies), but last year the actual total was 24,400 – two and a half times as great.[21] This overcrowding has led to a "power war," with stations upping their power beyond their registered limit, trying to drown out the competition. Stations also regularly move off their assigned frequency, trying to find "clear air," and broadcast on more than one frequency, hoping that at least one signal will be heard. (See Glenn Hauser's guide to current English-language programs, p. 113.)

The United States is not helping matters. We are one of the largest international broadcasters (see chart), and the Carter administration is taking steps to increase our broadcasting even further. A little-noticed **Report on International Broadcasting** was sent by the President to Congress on March 22, 1977. It proclaimed that "International broadcasting is a key element of United States foreign policy," and that there is:

> An additional requirement for four new 250-kilowatt [Voice of America] transmitters in sub-Sahara Africa to provide a reliable signal in East and South Africa and eight similar transmitters to strengthen existing VOA broadcast facilities in the western Pacific region . . . [as well as] an addition of sixteen 250-kilowatt transmitters for broadcasting to Eastern Europe and the USSR (5 for Voice of America, 11 for [Radio Free Europe/Radio Liberty]).

Since the **Report** gave good short descriptions of what the Voice of America and Radio Free Europe/Radio Liberty are, I'll just quote it:

> The VOA is an integral part of the U.S. Government. Its mission is worldwide and the primary functions are to present world news, to express and explain U.S. policy and American society and institutions. RFE/RL, on the other hand, is organized as a non-profit corporation funded by Congress under the statutory oversight of the Board for International Broadcasting. Its task is to encourage a constructive dialog with peoples of the USSR and Eastern Europe, and broadcast content is focused on the concerns of these peoples. VOA broadcasts are generally, if reluctantly, accepted by the Soviet and East European regimes as an official activity of the U.S. [Government]. RFE/RL broadcasts are heavily jammed in the USSR, Czechoslovakia, and Bulgaria and to a lesser extent in Poland as well.[22]

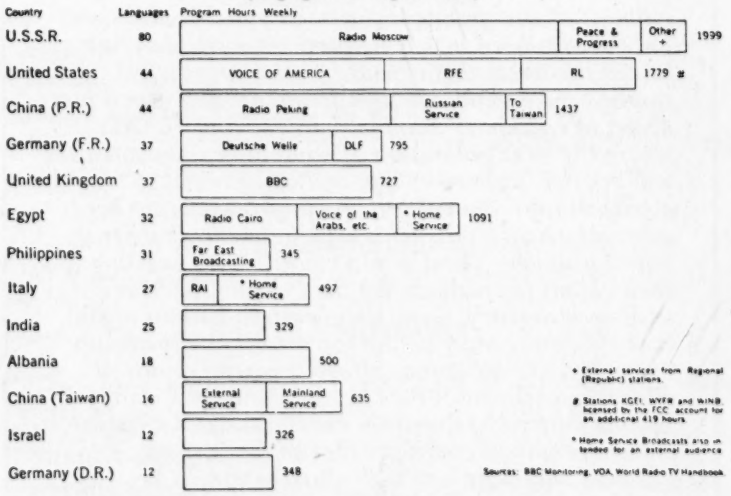
The Voice of America is run by the International Communications Agency, which replaced the United States Information Agency in 1978. At the time of the changeover, it had 109 transmitters.[23] The Board for International Broadcasting (BIB) was created in 1973, after it was revealed that Radio Free Europe and Radio Liberty, far from being supported by voluntary donations of American citizens, were mainly funded by involuntary donations – taxes – channeled through the CIA. (The relationship with the CIA ended in 1971.)

The short wave "power war" is clearly portrayed in the BIB's **Fifth Annual Report** (1979):

> In 1973, RFE and RL utilized a total of 45 transmitters with a combined power of 3,775 kilowatts. . . Between 1975 and 1977, total power was raised to 4,845 kilowatts.[24]

Eleven of the sixteen transmitters requested by President Carter in 1977 were under construction at the

THE LEADING INTERNATIONAL BROADCASTERS, 1977
(Languages and Program Hours)



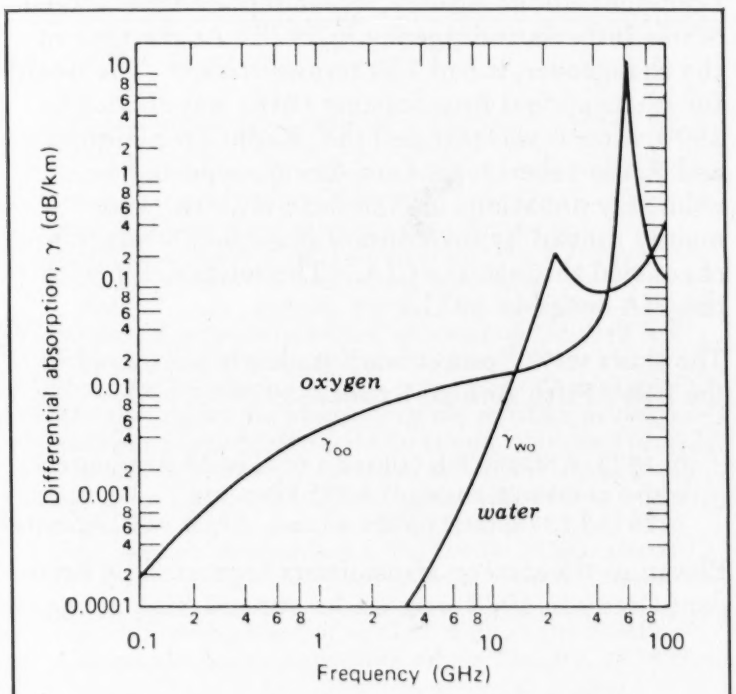
This comparative chart is somewhat misleading in that it does not include our Armed Forces Radio and Television System, with stations on bases around the world, and large non-military audiences. If you include AFRTS, we're the leading broadcaster.

Chart reprinted from the *Board for International Broadcasting Fourth Annual Report - 1978*, p. 7.

time the **Fifth Annual Report** was issued, and the additional 2,750 kilowatts they provide will represent a doubling of transmitter power since 1973. (This does not include the 3,000 kilowatts increase for the Voice of America.)

Developing countries are also leaping into the fray. They see short wave as a way to break free of the Reuters-UPI-AP control of how they're portrayed abroad. The First International Broadcasting Conference of Non-aligned Countries was held in Yugoslavia in October of 1977. About 70 delegations met to discuss ways of closing the gap between the overdeveloped (the term is certainly appropriate here!) and underdeveloped countries. (Was this a direct response to Carter's **Report**?)

The Carter administration's support for international broadcasting also created a certain amount of havoc with our WARC proposals. With the March 22, 1977 **Report** as their mandate, the ICA and the BIB apparently were quite adamant about getting a large



The radio spectrum has been able to accommodate millions of new frequency users in part because there have always been higher frequencies available. But just as the west-moving land frontier eventually reached the Pacific, the high frequency frontier is just about to encounter a similar barrier: over 10 GHz, where the next generation of communication satellites will operate, airborne water and oxygen become highly absorbent of radio energy. No improvement in hardware can change this. This high frequency barrier is one reason why Third World countries are pressing their claims for reallocating the existing spectrum with such urgency – and why western nations argue that efficiency must be the top priority of spectrum management: we cannot afford "merely" political allocations schemes. Fact is, our traditional claim-staking pattern of spectrum use is none too efficient and there's no inherent conflict between more efficient and more equitable distribution. The problem, however, is that any major reallocation plan would require a very expensive and technically awkward transition phase. Can we afford a better system? Can we afford not creating a better system?

Chart is from *International Radio Consultative Committee (CCIR) Report 234 (1966). The CCIR is a bureau of the ITU.*

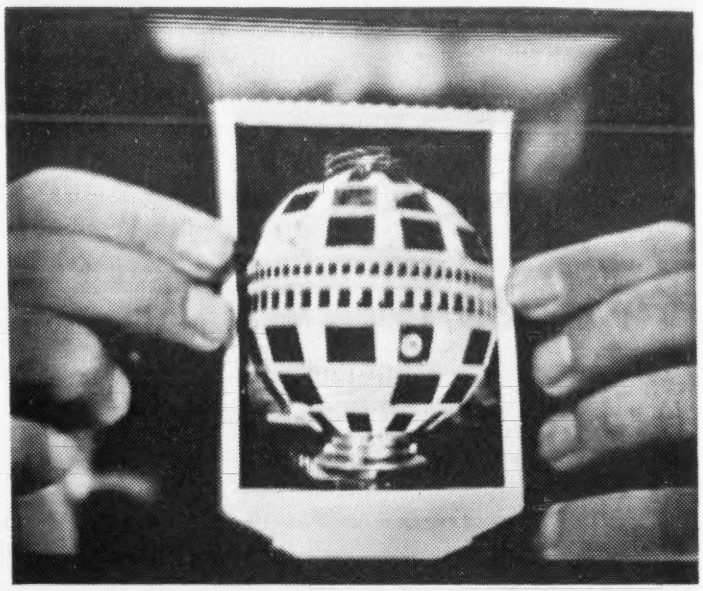
increase in allocation for their activities in the proposals. When the FCC's **Docket No. 20271 Report and Order** was issued, containing the substance of the U.S.'s submission to WARC, it was accompanied by an unusual "disclaimer" signed by two of the FCC Commissioners (Quello and Washburn), which suggests that some people in the Executive Branch realized how provocative our proposed increase in international broadcasting would appear to other countries. As it has not been widely circulated, I'd like to quote the bulk of it:

> The frequency allocations for international broadcasting contained in today's **Report and Order** – totalling an increase of 865 kHz – reflect but one alternative now under active consideration within the Executive Branch of the Government. This total falls some 800 kHz short of the proposals that have been made by the International Communications Agency and the Board for International Broadcasting.
>
> Inclusion here of the 865-kHz alternative was not based on any independent analysis by the Commission. The FCC has merely deferred judgment in this matter to other agencies of the Executive Branch.
>
> In the interest of accuracy, we believe it should be brought to the attention of all interested parties, here and abroad, that at the time of the Commission's action (December 5, 1978) there has yet been no decision within the Executive Branch as to a final figure for a U.S.-proposed frequency allocation for international broadcasting.
>
> This is the purpose of our joint separate statement.[26]

Glen Robinson, head of the U.S. WARC delegation, told me three months later, that no decision had yet been reached. I have since been informed that a decision is imminent (as of April 19), and the proposed increase will be around 350 kHz – still a third more than the proposed AM-band increase.

To deal with the tremendous overcrowding of the short wave bands – 350 kHz will hardly affect it – the U.S. is also proposing a gradual changeover to "single sideband" transmission. As I understand it, that would allow twice as many stations to be accommodated in the bands, but would make all present receivers obsolete. No one I've consulted has been able to say whether or not this idea would be acceptable to other nations. It would, in any event, take about fifteen years to implement, and would not offer an immediate solution to the crowding problem.

Unlike broadcasting satellites, and because of the entrenchment of the major international broadcasters, the Third World has objected more to the inequitable distribution of channels than to the lack of "prior consent." This may also be due to short wave's long history, because sound broadcasting is less "intrusive" than sound-and-picture broadcasting, because they feel that short wave technology is no longer the domain of the advanced nations, as satellite technology still is. Whatever. It is likely that there will be at least one proposal at WARC for allotting international broadcasting channels on a nation-by-nation basis, with a guaranteed minimum for all, and a maximum imposed on the major broadcasters. What this will lead to is anybody's guess. As Harry Helms wrote in this April's **Review of International Broadcasting** (see review, p. 113):



Media layered into message: you're looking at a photo-offset print of a photograph of a TV screen containing an image received from Telstar (the first still photo ever transmitted by space satellite) of a TV camera-shot of a Polaroid photo of Telstar. July 10, 1962. Reprinted with permission of American Telephone and Telegraph Co.

It should be obvious to anyone that there is no way the Third World (whatever that term means) can "prevent" the Developed Nations from doing anything they please with regard to frequency use. If the VOA and Radio Moscow decide to open 250 kW transmitters on 60 meters, what can the Third World do to "prevent" them from doing so?[27]

Remote Sensing

Since the adoption of the broadcasting satellite plan in 1977, the focus of the "prior consent" versus "free flow" debate has shifted to other areas, mainly to the issue of transmitting data about the residents of one nation into computers in another nation, where the former nation's privacy laws could not be applied, and the issue of the remote sensing of one country by another country's satellite. As the first issue is only tangentially related to WARC, I'll not discuss it.

The gathering of intelligence for military purposes, in this case by satellite, has always been recognized as an infringement on national sovereignty and, as such, has been carried on covertly. In the civilian sphere, too, there is little doubt that sophisticated institutions can use remote-sensing data to increase their political and economic power. Knowledge of likely oil deposits, projections of crop yields, better estimates of mineral concentrations can help developed nations' governments and multinational corporations make better political and economic judgments. Although international law traditionally grants nations exclusive rights to their own national resources, remote-sensing technology creates the question of whether or not a state also has exclusive rights to *information* on those national resources.[28]

As you might expect, the United States vigorously denies the notion that any nation has the right to prevent us, or anyone else, from surveying their territory from space and selling the information, or processing it, or doing whatever they please with it

Perhaps the best example of the staying power of ACRONYMS is the appearance of what we will call "Nested ACRONYMS." Here, an ACRONYM is constructed by having one of its letters (usually the first), stand for another ACRONYM. Example: The first NASA (oops) Earth Resources Technology Satellite was called ERTS. The Department of the Interior had previously formed an Office in Washington to study the imagery obtained by this satellite. The Office was called EROS (ERTS Resources Observation System). When the EROS Office opened up its Data Center in Sioux Falls it was called EDC (EROS Data Center), of course. (No fooling, wait, there's more.) EDC is now implementing a new Digital Image Processing System called – you guessed it – EDIPS, where the E stands for EDC. What should concern us all is if a Geographic Analysis Division is ever formed at the EDIPS facility (EGAD), and a Remote Terminal Service be installed there (ERTS). The ACRONYM-ic circle would thereby be closed, the stars would go out, and the World Undoubtedly End, (WUE) . . .

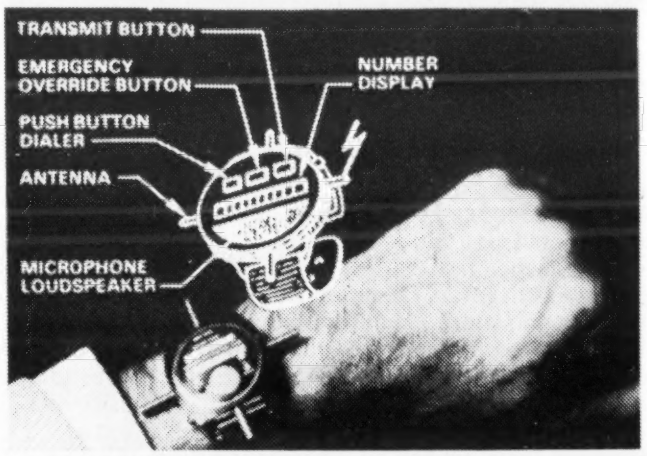
—Sent by G.S. Wunn
Germantown, Maryland

because of the "free flow" of information doctrine. Virtually all other countries oppose us on this issue.

According to my sources, the U.S. is taking the stance that WARC can only deal with the issue of remote sensing by satellite in the narrow sense of remote sensing at radio frequencies: observations made at higher frequencies (over 3000 GHz), including the optical band, are outside the ITU's jurisdiction. Of course, since radio frequencies have longer wavelengths (longer than light, that is), the resolution of satellite surveys made in those bands is rather crude and relatively little resource surveying occurs there (however, covert "signal intelligence" eavesdropping goes on all the time; the ITU traditionally looks the other way). Water, however, does have some natural "resonances" in the microwave portion of the spectrum, and the U.S. is proposing at WARC that a few bands encompassing these resonances be set aside exclusively for satellite observation of things like airborne moisture and the wetness of soils. I personally am very curious to see how WARC handles this highly sensitive question. Many nations recognize the importance, and the great value of sharing, resource information obtained by satellites, but they would rather see such surveys done and the information disseminated by an international agency. As long as remote sensing is performed by individual nations under their own preferred policies – without regard for the observed nations' preferred policies – we will undoubtedly see nations continue to assert the right of "prior consent."

Constraints

Those are some of the main areas that have been identified as central to the discussions at WARC. As I've already said, all discussions about WARC – what it's about, what will happen, what it means – are necessarily speculative and should not be taken as definitive. Many people have commented that describing WARC is something like the blind men trying to describe an elephant by each of them feeling a different part of its body: you get different pictures from different people, and no one of them is quite comprehensive and reliable enough to base a strong



Ivan Bekey, head of Advanced Concepts at NASA, recently published descriptions of three "very attractive system concepts" that involve the use of large shuttle-launched, geosynchronous satellites. One was for electronic mail, one was for educational television, and one that really caught my fancy was a radiotelephone system based on Dick Tracy-style wrist receiver-senders inter-connected through a single orbiting switchboard. As in the case of Gerard O'Neill's space colonies, what's significant here isn't the originality of the idea, but the working-out of the practical details.

Bekey's system would provide 230,000 voice channels, allowing up to 25 million people to make an average of five one-minute calls per day. This many channels would normally require a prodigious amount of radio spectrum – a minimum of 2.3 GHz - if the satellite's downward beam covered the entire continental U.S. But by splitting the beam into 6,930 smaller beams, each covering a ground area of 30 miles in diameter, fitting them together to cover the whole country, and reusing frequencies in non-adjacent areas, all the voice channels could be packed into only 60 MHz of spectrum: a band about as wide as is currently occupied by TV channels 21 - 31.

The satellite would weigh about 54,000 pounds, most of it in the 220-foot-wide antenna structure. It could be launched in one piece and opened up in space, or it could be launched in pieces and assembled. The wrist radiotelephones would be about the same size and weight as today's digital watches. If mass-produced, they could cost as little as $10 each. Total cost of the system: $2.29 billion.

According to Bekey (his emphasis), "the total R & D, investment, and operation costs in the satellite approach could be recouped in a ten-year period by charging the user only half a cent per minute of conversation. The alternative ground system would have to charge 5.4 cents per minute. . . These costs to the user represent the breakeven charges . . . Under the assumption that the users are charged an average of 3.6 cents per minute of conversation, [a comparable] ground system shows a loss of $0.4 billion a year, while the space system generates a profit of $1.6 billion a year. The space system would have an income of $16 billion over the ten-year operation and for every year thereafter. These numbers become even more impressive with more long-distance calls, the likely trend once the users discover that long-distance calls do not cost extra. Will industry pass up such an opportunity?"

All the technology is either already available or on the immediate horizon. If work started in the next year or two, the system could be in operation by the end of the '80s. ●

See the February, 1979 issue of *Astronautics & Aeronautics* (pp. 42-56) for more details.

opinion on. Before closing, I should point out that the amount of change that can plausibly occur at WARC is limited by many factors. So rather than expect a whole new rulebook, written by the new majority, it is more realistic to look for the smaller number of issues where there is a broad consensus for change – or, regardless of whether or not change is likely, the conflict is at least illuminating. That's what I've tried to do.

In general, the most important constraint on change is simply the hundreds of billions of dollars the nations of the world have invested in present-day equipment. Any change that would make a sizeable percentage of that investment obsolete would encounter a lot of resistance. Beyond that, the majority of the people who will be delegates at WARC, as Glen Robinson observed, are technicians and/or bureaucrats – types not exactly known for their revolutionary impulses. And, as I've already mentioned, nations are allowed to enter reservations to regulations they do not want to be bound by. All these together put a premium on compromise and accommodation as part of the rule-changing process.

In point of fact, the ITU has no power to enforce its regulations. It is only an artifact of the agreements between nations who use the radio spectrum, and it can only forward complaints of violations from one nation to another and provide a framework for arbitrating disputes between them. Otherwise, it depends on "good will," a nation's word (in the form of a treaty), the pressure of adverse opinion – and the enforcement power of the spectrum itself. Interference and equipment incompatibility are the ultimate penalties and they not only justify the ITU's existence, but continually guide its decision-making. In a very real sense, the spectrum itself, its susceptibility to degradation, imposes a discipline greater than any treaty-created enforcement power could be, and its ability to regenerate instantly makes it the most forgiving of teachers. ■

Many people helped in the preparation of this article; special thanks are due to Anthony Rutkowski, Herbert Schiller, Glen Robinson, Christopher Sterling, Daniel Grant, David Wright, Andrew Horowitz and Herbert Turner. They gave me the facts; I take credit for the errors. In addition to personal aid, I found certain publications, not mentioned in the notes below, invaluable:

"Special section: The U.S. Faces WARC," *Journal of Communication*, Vol. 29, No. 1 (Winter, 1979), pp. 143-207.

Weigend, Robert E., Jr., "1979 WARC: Advisory Committee Meets for First Time," *Satellite Communications*, Vol. 2, No. 8 (August, 1978), pp. 18-23.

"World Administrative Radio Conference, WARC-79: Ten Decisive Weeks for the Future of Telecommunications," International Telecommunication Union Press Release, 8 March 1979.

Control of the Direct Broadcast Satellite: Values in Conflict (Palo Alto: Aspen Institute Program on Communications and Society, 1974).

Richstad, Jim, and Jackie Bowen (eds.), *International Communications Policy and Flow: A Selected Annotated Bibliography* (Honolulu: East-West Communication Institute, 1976).

Lent, John A., "The UNESCO Debate on the Role of Mass Media in the Third World: An Assessment of the Issues, Fora and Literature" (paper presented at the Third Conference on Culture and Communications, Temple University, Philadelphia, PA, March 22, 1979).

Akima, H., P.M. McManamon, P.I. Wells, *Fixed-Satellite and Broadcasting-Satellite Service Considerations for 1979 GWARC Planning*, NTIA-SP-78-2 (Washington: National Telecommunications and Information Administration, October, 1978).

NOTES

1. *I'm hardly qualified to speak on this subject, but I have checked out:*

Justasen, Don R., and Arthur W. Guy (eds.), "Special Issue: Biological Effects of Electro-magnetic Radiation," **Radio Science**, Vol. 12, No. 6(S) (November-December, 1977); Office of Telecommunications Policy, **The Assessment of Non-Ionizing Electro-magnetic Radiation**, (Washington: U.S. Government Printing Office, 1976); and Hazzard, Dewitt G. (ed.) **Symposium on Biological Effects and Measurement of Radio Frequency/Microwaves** (Washington: U.S. Government Printing Office, 1977). *In introducing their issue of* Radio Science, *Justasen and Guy note that investigations of radio's biological effects are leading to the conclusion that some carefully controlled exposures are potentially beneficial: "Many investigators are reporting that components of the immune system can be aroused by non-ionizing electromagnetic radiation and that cancer may yield to 'RF fever' when induced as a primary treatment or as an adjuvant to X-irradiation or chemotherapy." Elsewhere in the issue, Donald Adrian observes that "biological effects can be highly frequency selective and care must be used in extrapolating effects from one frequency to another." In general, biological effects have only been detected in a few frequency and power "windows."*

2. Howeth, Linwood S., **History of Communications-Electronics in the United States Navy** (Washington: U.S. Government Printing Office, 1963), p. 71. Howeth attributes the story to the **Scientific American**, 17 August 1903.

3. Barnouw, Erik, **A Tower in Babel** (New York: Oxford University Press, 1966), p. 17.

4. Howeth, pp. 71-72, 501, and "Appendix B. Final Protocol, First International Radio Telegraphic Conference, Berlin, 1903," pp. 547-548; Archer, Gleason L., **History of Radio to 1926** (New York: The American Historical Society, 1938), p. 64. *Both Howeth and Archer report the "CQ" proposal.*

5. Howeth, p. 501, and "Appendix F. Convention Adopted by Second International Radio Telegraphic Conference, Berlin, Germany, 1906," pp. 557-569.

6. Feldman, Mildred L.B., **The United States in the International Telecommunication Union and in Pre-ITU Conferences**, (Mildred L.B. Feldman, 1975), pp. 26-29. *The Supplementary Agreement is reprinted in Howeth on p. 560. The phrase "unrestricted interchange of communication between all stations" is quoted by Feldman from the* Report of American Delegation. *It does not appear in the Supplementary Agreement.*

7. *Two good histories of the ITU are:* Codding, George Arthur, **The International Telecommunications Union: An Experiment in International Co-operation** (Leiden: E.J. Brill, 1952) and Michaelis, Anthony R., **From Semaphore to Satellite** (Geneva: International Telecommunication Union, 1965).

8. Rutkowski, A.M., "The 1979 World Administrative Radio Conference: The ITU in a Changing World," **The International Lawyer**, Spring, 1979 (manuscript, pp. 5-6).

9. Haffner, Victor, "Appendix B: Radio-Frequency Planning," **Global Communications in the Space Age: Toward a New ITU** (Markle Foundation/Twentieth Century Fund, 1972), p. 34.

10. *The best books that I know about on spectrum management are:* Levin, Harvey J., **The Invisible Resource: Use and Regulation of the Radio Spectrum** (Washington/Baltimore: Resources for the Future, Johns Hopkins Press, 1971); Office of Telecommunications Policy, **Manual of Regulations and Procedures for Radio Frequency Management** (Washington: U.S. Govt. Ptg. Office, 1976); "Part II: Special issue on Spectrum Management," **IEEE Transactions on Electromagnetic Compatibility**, EMC-19 (August, 1977); and Leive, David M., **International Telecommunications and International Law: The Regulation of the Radio Spectrum** (Dobbs Ferry, NY: Oceana Publications, 1970).

11. Federal Communications Commission, **Docket No. 20271, Report and Order** (December 5, 1978).

12. Hudson, Heather E., "Implications for Development Communications," **Journal of Communication**, Vol. 29, No. 1 (Winter, 1979), p. 181. Ms. Hudson seemed to be quoting Schrum, Richard E., "Foreign Frequency Policies: Their Impact on WARC 1979," (paper presented at EASCON, Arlington, VA, September 25 and 27, 1978).

13. Resolution Spa D: "Relating to the Use by all Countries, with Equal Rights, of Frequency Bands for Space Radio-Communication Services," quoted in "Appendix D: Observations on the World Administrative Radio Conference for Space Telecommunication (WARC-ST), Geneva, June-July, 1971" in **Global Communications in the Space Age: Toward a New ITU** (see note 9), p. 60.

14. **Report of the United States Delegation** (Department of State, Office of TeleCommunications, TD Serial No. 50, 1974), p. 28, note; quoted in Rutkowski (see note 8), p. 9.

15. "Due to the multitude of allotments (up to 36 countries) on each channel, the elimination of priorities [i.e., the "first come, first served" principle], the adoption of unworkable implementation procedures, and the authority given to the [IFRB] to make allotments on a highly arbitrary basis." **Report of the United States Delegation** (see note 14), pp. 28-29; quoted in Rutkowski, p. 22, footnote 36.

16. See Article 11, "Final Acts of the World Administrative Radio Conference for the Planning of the Broadcasting-Satellite Service in the Frequency Bands 11.7-12.2 GHz (in Regions 2 and 3) and 11.7-12.5 GHz (in Region 1)," (Geneva: International Telecommunication Union, 1977); quoted in Rutkowski, Appendix D-1.

17. Gould, R.G., and E.E. Reinhart, "The 1977 WARC on Broadcasting-Satellites: Spectrum Management Aspects and Implications," **IEEE Trans. on Electro-magnetic Compatibility**, EMC-19 (August, 1977), p. 173.

18. Rutkowski, pp. 10-11.

19. Barnouw, Erik, **The Image Empire** (New York: Oxford University Press, 1970), pp. 70-73; and Cooley, Hazel, **Vision in Television: The Origins and Potentialities of Educational Television** (New York: Channel Press, 1952). *The "socialistic" characterization is from an editorial in* Broadcasting, (April 19, 1954), *quoted by Barnouw, p. 73. Strictly speaking, channel reservations for noncommercial broadcasting began in 1940 in the FM band, but only a small number of FM receivers were sold before World War II came. None were manufactured during the War. After the War, the FM band was moved to a different part of the spectrum and 20% of the channels were reserved for noncommercial use. See* **A Public Trust: The Report of the Carnegie Commission on the Future of Public Broadcasting** (New York: Bantam, 1979), pp. 313-314.

20. See Riegel, O.W., **Mobilizing for Chaos: The Story of the New Propaganda**, (New Haven: Yale University Press, 1934); Childs, Harwood L., and John B. Whitton (eds.), **Propaganda by Short Wave** (Princeton: Princeton University Press, 1943); and Hale, Julian, **Radio Power: Propaganda and International Broadcasting** (Philadelphia: Temple University Press, 1975).

21. Compiled from **Board for International Broadcasting: Fifth Annual Report** (Washington: U.S. Government Printing Office, 1979), p. 27.

22. **Message from the President of the United States Transmitting a Report on International Broadcasting** (Washington: U.S. Government Printing Office, 1977), House Document No. 95-107, pp. 1-5.

23. "External Cultural and Informational Programs of Selected Non-Communist Countries in 1977," Research Report R-22-78 (International Communications Agency, Office of Research and Evaluation, 1978).

24. **Fifth Annual Report – 1979** (Board for International Broadcasting, 1979), p. 26.

25. "International Broadcasting Conference of Non-Aligned Countries," Research Note N-1-78 (United States Information Agency Research Service, January 19, 1978).

26. Joint Separate Statement of Commissioner Abbott Washburn and Commissioner James H. Quello, **RE: Docket 20271, WARC 1979 Proposals**, December 5, 1978.

27. Harry Helms, KA5M, "WARC 79 – Corrections and Clarifications," **Review of International Broadcasting**, April, 1979, p. 2.

28. Gunter, Jonathan F., "An Introduction to the Great Debate," **Journal of Communication**, Vol. 28, No. 4 (Autumn, 1978), p. 153.

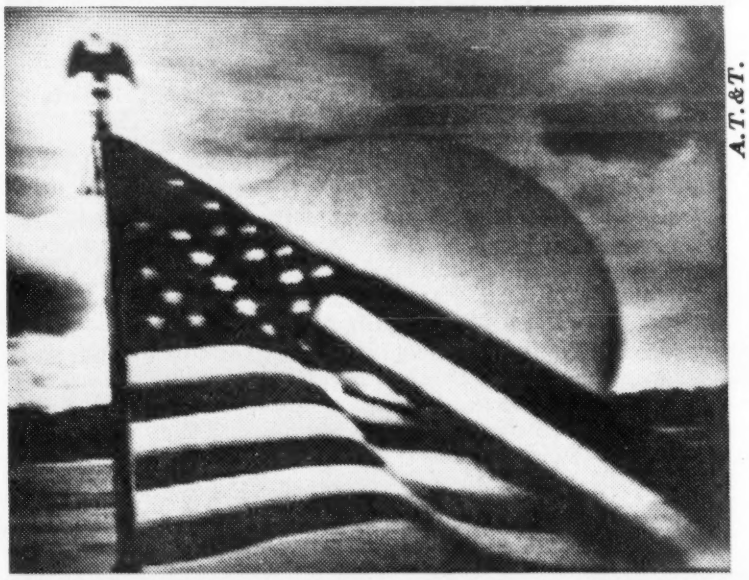
WARC, the Third World, & the New

BY TRAN VAN DINH

Kể từ ngày thất thủ kinh đô
Ông Tây qua giăng giây thép,
hoa địa dồ nu'óc Nam.

(Since the fall of the nation's capital,
The Westernman came, put up the telegraphic poles
and mapped Vietnam.)

— a popular Vietname folksong,
circa 1900



A.T.&T.

The American flag flying in front of the Andover, Maine radome is the first television picture ever sent to space and back. This successful transmission was made via the Bell System's experimental satellite, Telstar, on July 10, 1962.

As poignantly expressed in the Vietnamese folksong, which had its echoes in other parts of the Third World, telecommunications were first perceived by colonized peoples as a visible instrument of colonial power. At the present moment, even though most of the former colonies have recovered their autonomy, and the Third World represents over 100 out of 154 in the membership of the world community (the United Nations, the ITU, etc.), the continuing existence of economic and cultural imperialism[1] has prompted the Third World to demand the creation of a New International Economic Order (NIEO) and its corollary, a New International Information Order (NIIO). What is the NIIO? To answer this question, one should first ask another one: What was the old one?

The old international information order, as defined and understood by the Third World – which, of course, is not a monolith – was an order created by colonial powers, an order that destroyed their traditional, pre-colonial native cultures. The colonial societies were "drained of their essence, cultures trampled underfoot, institutions undermined, lands confiscated, religions smashed, magnificent artistic creations destroyed, extraordinary possibilities wiped out."[2]

That cultural destruction, pernicious and durable, has never been total, however; the colonial occupation has never really been complete. While cities in the colonies became "westernized," the countryside, the peasantry, not directly in contact with the colonizers, but suffering all the same from the colonial exploitation, was left to play the role of keeper and defender of the native cultures. As Amilcar Cabral, the recognized theoretician of modern African revolution, has pointed out:

> Certainly, imperialist domination calls for cultural oppression and attempts, either directly or indirectly, to do away with the most important elements of the culture of the subject people. But the people are only able to create and develop the liberation movement because they keep their culture alive . . . and because they continue to resist culturally, even when their political and military resistance is destroyed. And it is cultural resistance which at a given moment can take on new forms – political, economic, armed – to fight foreign domination.[3]

Consequently, the post-World War II national liberation movements aimed not only at driving the foreign armies and administrations out, but also at reconstructing, elevating and purifying the national traditional cultures. A yin-yang relationship exists between tradition and revolution.[4] Tradition supplies revolution with historical continuity and legitimacy, while revolution actualizes tradition. Colonization being economic, political and cultural, successful decolonization has to address itself to the same interrelated domains.

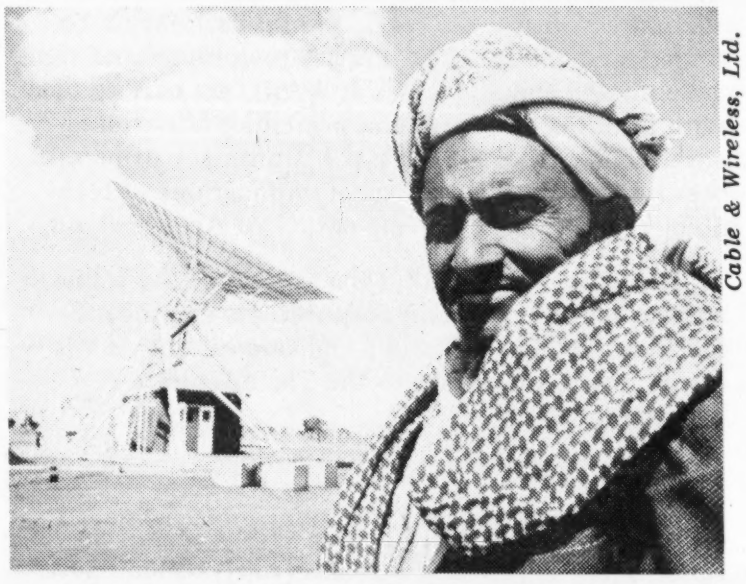
The New International Information Order, an arm of decolonization at the global level, strives at fighting the colonial order which persists in more sophisticated and subtle forms. Hedi Nouira, Prime Minister of Tunisia (a Third World country considered by the U.S. as a moderate one), set forth in 1978 the objectives of the NIIO:

> The New International Information Order, as we perceive it, aims at definitely abolishing the sequels of the colonial era and the state of mind which divides humanity into two categories: the strong and the weak, the dominator and the dominated. The former have the right to inform

Poet, novelist, scholar – Tran Van Dinh left Vietnam in the early '60s, travelled widely, especially through Africa, and came to America in 1967. He is currently teaching international politics in the Department of Pan-African Studies, Temple University (Philadelphia).

–Robert Horvitz

International Information Order



Cable & Wireless, Ltd.

According to Satellite Communications *(March, 1978), "Of the five regional communications satellite systems currently being planned in various parts of the world, Arabsat appears to be the furthest ahead in its scheduled development of an operational system. The Arabsat goal is to launch its first satellite in 1980." Shown here is an Intelsat station in Yemen – and a technological "incongruity" that is becoming more common. Satellites offer more dramatic benefits to developing countries than to highly-mediated countries like the U.S.: Where the terrain is hostile and the population sparse, there may be no other practical way to establish fast and reliable communication links.*

> and to be informed, even on the most trivial facts. For the latter, no possibility is offered them to make their difficulties and their expectations known. They have access only to information deliberately fabricated by their lords and masters. The New International Information Order must uphold not only the rights of individuals to be heard, but also of communities and nations to express their expectations, their concerns, as well as the vicissitudes of their struggle for a better future. This New Order will contribute to the defense of the causes of liberty and justice. It will help to avoid acts of provocation, to banish intellectual or ideological hegemony and racism, and to maintain world peace.[5]

At the 1979 WARC, as much as at the 1978 General UNESCO Conference in Paris, as well as in other similar North-South dialogues, the Third World as a group will be facing, besides technical issues, the same problems which have made the call for an NIIO such an important item in its agenda for global collective bargaining. They are:

1. The U.S./western dominance of world communications and the cultural imperialism reflected in exports of news, publications, films, television.

2. The U.S./western principle of "first come, first served" in the use of frequencies and satellite orbits, against the Third World's insistence on equal access to the spectrum for all nations, large or small, for *a priori* assignment of frequencies and orbital positions.

3. The sacred U.S. doctrine of "free flow" of information across national borders versus the Third World's demand for a "balanced flow," respect for national sovereignty, and the right of prior consent. These issues are particularly important in regard to Direct Broadcast Satellites and remote-sensing. In these issues, the Third World is joined by Western European countries such as Sweden, Germany and France.

While a just resolution of the above problems would be necessary for the implementation of the NIIO, the Third World is facing a much larger threat: the emerging, more "comprehensive and far-reaching structure of world-wide domination in . . . computer communications." This new structure was described during U.S. Senate hearings in June, 1977:

> A very large amount of data about all sorts of matters – individual and national, social, commercial, economic and military – are now being processed and transmitted between international super-corporations, national governmental bureaucracies, and scientific and academic institutions. Already, institutional patterns have developed to facilitate these activities. An examination of the structures and relationships now in place may help to create a realistic assessment of the present world information order. Unless the social forces underlying and determining current computer communications are revealed and understood, ground gained in overcoming information dependency in traditional areas may be retaken by those who dominate the new terrain.[6]

In all negotiations between groups or nations, each one tries to maximize its existing strengths. At WARC 1979, the United States (and on most issues, other Western countries) will, as a general strategy, accentuate the technical and bypass or slight the political-ideological. The U.S. will attempt to:

1. Minimize its differences with other industrialized countries.

2. Link some of its interests with the USSR as a fellow industrialized nation.

3. Divide the Third World, especially the "radical" from the "moderate" (pro-U.S.), the "Arab-African" from the "Sub-Sahara African," the OPEC countries from the rest of the world.

4. Divert or submerge confrontations with offers of technical aid and technical training.

5. Orchestrate a mass media campaign, both in the U.S. and in the Third World, similar to the ones conducted during the Nairobi 1976 General UNESCO and the 1978 Paris General UNESCO meetings. The campaign would defend the U.S. positions and accuse the Third World of being unreasonable, totalitarian, immature, irresponsible, hostile to progress, too ideological minded, and dupes of the Communists. It will be mainly directed at the "hardliners [who] want to redistribute the WARC broadcast bands, ignor-

ing present operating facilities and programming."[7] It will demonstrate that any modification of the *status quo* at WARC would "raise the cost of our international phone calls, interfere with corporate data exchanges and hamper U.S. radar systems and the satellites which tell us whether the Soviets are keeping SALT agreements."

To be able to defend itself at WARC, the Third World should:

1. Beware of its strengths and weaknesses. The Third World's strengths are in the number of votes it could muster, in its possession of vast human and natural resources, in its enormous geographical area, in the richness and diversity of its cultures. Its weaknesses are economic and technological underdevelopment; political instability and disunity; in most countries an inability to educate and mobilize the masses for national projects; a lack of organic links between the elite and the rest of the nation, on the one hand, and between urban and rural populations, on the other; and a superficial understanding of the legacy of colonialism and the realities of the existing world order. Nevertheless, the conscious recognition of these shared weaknesses, the commonality of a humiliating colonial past and pride in their old civilizations and cultures, have drawn peoples of varied religious, political, and social backgrounds into associations of mutual assistance, such as the pre-World War II's Pan-African, Pan-Arab and Pan-Asian movements, and the present Non-Aligned movements, Group 77 and the Organization of African Unity.

2. Develop and refine its general concepts in dealing with the First and Second Worlds. I consider the struggle of the Third World for an NIEO and an NIIO as a collective of national liberation movements, following generally the same ideology, the same strategies, the same tactics, with different weapons and different casualties. The ideology is broadly anti-colonial/anti-imperialist, if not socialist in direction, translated into the concept of the supremacy of human relationships over technology. The strategy is a broad united front, first among Third World countries, extending later to the Second World and to the progressive peoples of the First World. Ideas for the implementation of this united front are contained in the various Resolutions and Programs of Non-Aligned Summits, the next one to be held in Cuba at the same time as the 1979 WARC. (It would be appropriate for the Cuban Non-Aligned Summit to pass a Resolution backing the general position of the Third World on WARC, thus creating a unity of action at a timely moment.) The tactics, of necessity, are Judo tactics – that is, to turn one's weaknesses into one's strengths, to avoid unwinnable confrontations, to select precise targets for attacks.[8] The weapons are well-thought ideas and solid arguments backed by historical perceptions. The casualties are also ideas and arguments.

3. Sharpen and finalize a detailed battle-plan for the conference at the level of individual nations, after analysing all previous positions and agendas. At the same time, each Third World nation should consult with other countries in the same region and in other regions. Then it must start a campaign to educate the citizens on all issues involved at WARC.

4. Bear in mind that the more specific an issue is, the more political the tactic should be, because to understand the specific, one has to comprehend the general. All specific issues at WARC are easy to deal with in terms of the general principles of national sovereignty, prior consent, the supremacy of people over machines, the ideological implications of technology, and the self-serving nature of American aid.

5. Remember always that the dreams of the transnational communication corporations are, most of the time, the Third World's nightmares, that IBM's future hopes are similar to the Third World's bad memories. ■

NOTES

1. See my "Non-Alignment and Cultural Imperialism," **The Black Scholar**, December, 1976 (reprinted in Kaarle Nordenstreng and Herbert I. Schiller [eds.], **National Sovereignty and International Communication**, Norwood, New Jersey: Ablex Publishing Company, 1979, pp. 261-175).

2. Aime Cesaire, **Discourse on Colonialism**, New York: Monthly Review Press, 1972, p. 21.

3. Amilcar Cabral, **Return to the Source: Selected Speeches of Amilcar Cabral**, New York: Monthly Review Press, 1973, p. 60.

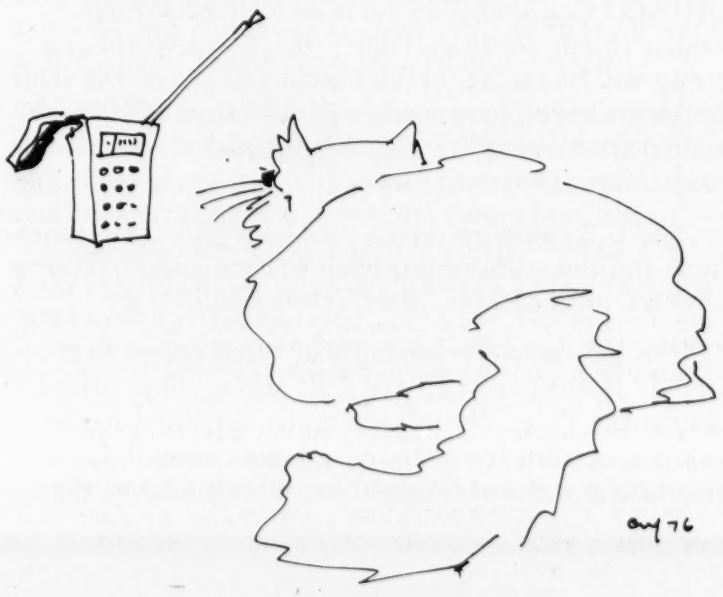
4. Nguyen Khac Vien, **Tradition and Revolution in Vietnam**, Berkeley, California: Indochina Resource Center, 1974.

5. Speech at the close of a symposium by The Conseil Superieur de l'Information (High Council on Information), Carthage, August 30, 1978. Translated from French by myself from "Corriger les desequilibres du systeme international d'information: Correct the imbalances in the international system of information," Ministry of Information, Tunisia, 1978, p. 13.

6. Herbert I. Schiller, Statement to the Committee, Senate Committee on Foreign Relations, Subcommittee on International Operations, June 8, 1977 (mimeo transcript). See also Herbert I. Schiller, "Computer Systems: Power for Whom and for What?," **Journal of Communication**, Vol. 28, No. 4 (autumn, 1978), pp. 184-193.

7. Leonard R. Sussman, "Who Rules the World's News?," **Newsweek**, October 2, 1978.

8. See "The Judo Lesson," in Nguyen Khac Vien, **Tradition and Revolution in Vietnam**, cited above.



Information Warfare — three good books

by Scott Thybony

Three books. Three points of reference along a 40-year course of secret warfare. Not only CIA, but now the multinationals and the power collectors. Information warfare, and it seems that we're fighting this one with the contexts from the last.

These are the best representations from the current literature on intelligence operations. To many of those involved the war still goes on. When you hear about the genocide being committed in the name of one ideology or another and the extent of reasoned terrorism being validated by one holy print-out or another, perhaps they're right. Perhaps not.

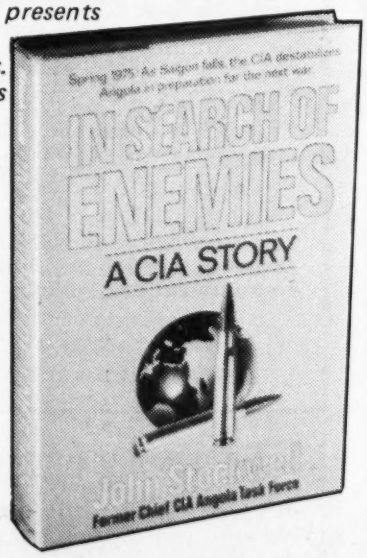
What is apparent is the high degree of poor thinking that underlies this whole covert world view. If we're going to buy into it we'd better do it with our ideas in order. Somebody's going to have to come to grips with the clandestine and in one way or another it'll probably be us. Whether we end up wrestling with Luther's devil or, like Blake's illustration of Job, with our own good intentions it must be done.

One caution on these books: they'll be a motherlode for conspiracy buffs and professional paranoids.

In Search of Enemies

Provides an insider's view of the day to day management of a covert CIA paramilitary operation that, ironically, was never intended to be won. Reading this you may find your political sensibilities oscillating between line-em-up-and-shoot-emism to the-hell-with-emism. The old question, though, continues to gnaw away. Where in this global village does our responsibility for the rights of others begin and end?

As someone who has lived on the raw edge of our foreign policy for some time, Stockwell presents an impressive argument for the elimination of covert operations. The weight of his argument rests not so much on moral outrage as it does on a presentation of the wrong kinds of thinking taking place in the intelligence community.



In Search of Enemies
(A CIA Story)
John Stockwell
1978; 285 pp.
$4.95 postpaid
from:
W.W. Norton and Co.
500 Fifth Ave.
New York, NY 10036

In from the cold? Case officers often come back unnoticed, drained by their experiences and haunted by their consciences, by the suspicion that the things they had done were pointless as well as cruel. They rarely have the same sparkle and drive on the next assignment — or the next. In offices throughout headquarters there were those who had given up, who were walking out their years before early retirement, becoming grey fixtures like the safes and Xerox machines.

•

As we have succeeded in making ourselves more like our enemies, more like the KGB, the world has taken note. Throughout Africa, Latin America, and Asia, at least, every legitimate American businessman, teacher, and official is suspiciously viewed as a probable CIA operative, capable of dangerous betrayals.

Spooks: The Haunting of America

The past intelligence failures of the CIA appear benign compared to Hougan's probe into the private use of secret agents by multinational corporations and the rich. Business as usual may not be what it appears. Watergate may not be an aberration. Goldfinger may not be a media fantasy.

Hougan throws a net of conspiracy over bits of information ranging from Timothy Leary and the Brotherhood of Eternal Love to Robert Vesco and private armies. Watch out, though. The plausible is dressed up to look so like the probable that a case of mistaken identity may occur.

Spooks
(The Haunting of America — The Private Use of Secret Agents)
Jim Hougan
1978; 478 pp.
$12.95 postpaid
from:
William Morrow & Co.
Wilmor Warehouse
6 Henderson Dr.
W. Caldwell, NJ 07006

While investigating Intertel, I scheduled an interview two weeks in advance with columnist Jack Anderson. Arriving for that interview, I learned that someone impersonating me had interrogated Mr. Anderson on the same subject the day before. There was no mistake, Anderson assured me, kindly consenting to 'a second' interview: the impersonator had identified himself as 'Jim Hougan — with a u'. Equally unnerving was litigation threatened by a private intelligence agency. Communicated to **Harper's** magazine, the threat was to the effect that if I published the contents of a long-distance conversation between myself and a source at the Battelle Memorial Institute, the agency would sue for libel. It wasn't the fear of litigation that dismayed me, but rather the fact that my telephone conversation with Battelle was still going on when the threat was phoned to **Harper's.**

•

The marketplace, in effect, has been subverted by an array of intelligence devices and techniques including burn-bags, codes, shredders, bugs, bagmen, PSE's, surveillance equipment, propaganda and financial laundries — so that taxes are commonly evaded, bribes, kickbacks, and industrial espionage are almost routine, the consumer is deceived, stockholders are cheated, and the government is kept in the dark.

A Man Called Intrepid

Like Freud and his exploration of the unconscious mind, Stevenson begins uncovering the hidden regions of the body politic. Recently declassified British files of secret operations during World War II show a blend of covert policy decision, unaccountability, and good intention that can bring out a country's best and worst. Perceptions of these wartime actions will range between shades of the Sorcerer's Apprentice to a clandestine Roundtable.

The complete record of classified wartime operations is still unavailable. What becomes almost unthinkable are those decisions that still remain secret after the magnitude of the **Intrepid** *disclosures.*

A Man Called Intrepid
(The Secret War)
William Stevenson
1976; 541 pp.
$2.50 postpaid
from:
Ballantine Books
455 Hahn Rd.
Westminster, MD 21157

If the Prime Minister evacuated Coventry, as he so desperately wished to do, he would tell the enemy that he knew their plans. The value of Bletchley and all that ULTRA implied for the future would be lost. If the citizens were not warned, thousands would die or suffer.

Churchill chose wormwood, and did not warn them, beyond the customary alerting of fire-fighting and ambulance services, normal procedure in areas that might be logically assumed to have appeared on the German list of targets for the night. The Germans struck on schedule: November 14. The raid was so devastating that Berlin boasted that every town in England would be "Coventryized."

The Changing Information Environment

Planet implodes! Everything is changed! Few notice! This book notices.

—SB

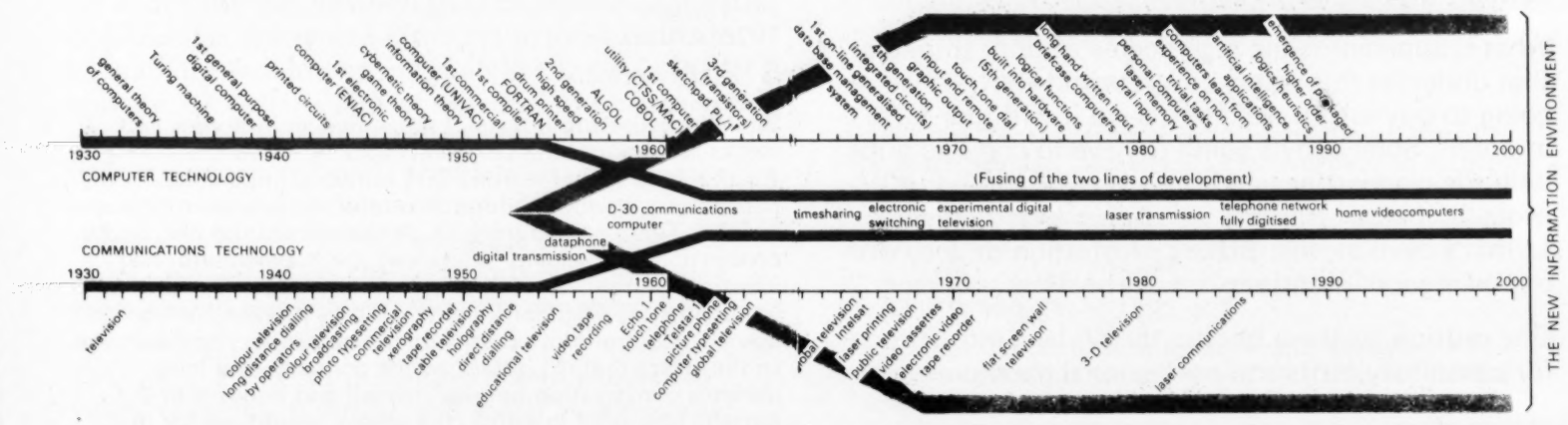
The Changing Information Environment
John McHale
1976; 117 pp.
$12.75 postpaid

from:
Westview Press
5500 Central Ave.
Boulder, CO 80301

Information and knowledge, as resources in themselves, are not reduced or lessened by increased use or wider sharing — rather they may gain in the process.

Implication for 'ins' and 'outs' of information-rich society

Information 'haves'	*Information 'have nots'*
Become basis for elites in a restratified society.	Training in applications of technology—how to use rather than what to use for.
More socially mobile, with diverse career paths and life style opportunities.	Will tend to be more locked-in to particular jobs—less able to change occupations.
Their acquisition of more and new knowledge becomes progressively easier.	May tend to resign themselves to helplessness and alienation—will seek and use less and less information.
Added capacity to create their own knowledge bases.	Less able to cope with perplexing changes.
More able to organise and associate at a distance via access to new techniques.	Will become suspicious of and hostile to the 'knowledge people'.
May possibly have more enlightened self-interest.	Limited social mobility.



Ham publications from ARRL

I'm not a ham (in the radio sense), but if I had the money and the time, I probably would be. The American Radio Relay League is the organization that coordinates amateur radio activities and their publications are the best way to get into the field. Here are some titles that looked interesting to me:

The Radio Amateur's Handbook. *"Internationally recognized, universally consulted. The all-purpose volume of radio. Packed with information useful to the amateur and professional alike. Contains hundreds of photos, diagrams, charts and tables. 56th Ed." $9.75 U.S., $10.75 Canada. $12.00 elsewhere.*

A Course in Radio Fundamentals. *"Twenty-six chapters present the electrical and electronic principles that are basic to understanding radio circuit operation. 5th Ed." $4.00 U.S. $4.50 elsewhere.*

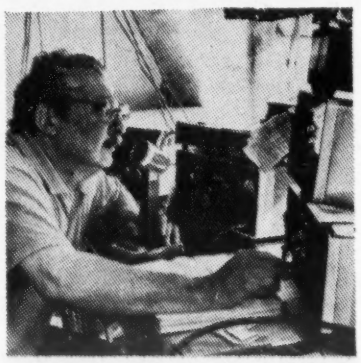
Understanding Amateur Radio. *"Explains in simple language the elementary principles of electronic and radio circuits. Includes how-to-build-it information on low-cost receivers, transmitters and antennas. A 'must' guide for the newcomer. 3rd Ed." $5.00 U.S. $5.50 elsewhere.*

Tune in the World with Ham Radio. *"The complete beginner's package. Everything needed to obtain a Novice license: theory, rules, how to assemble a station, and operating practices. With one-hour code cassette. 2nd Ed." $7.00.*

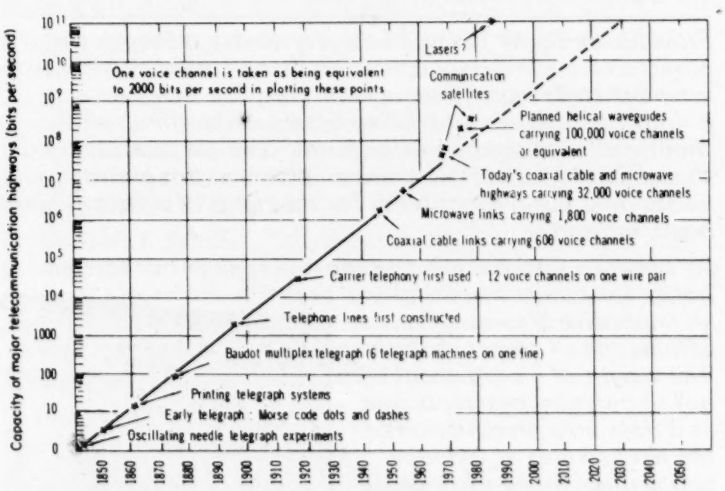
In addition, they publish a slick monthly magazine, QST, *that will keep you up-to-date on amateur activities, equipment, meetings, gossip, etc.* QST, *$12/yr., 12 issues. All publications from:*

American Radio Relay League
225 Main St.
Newington, CT 06111

—Robert Horvitz



Hank Greenberg W2LTP, of Cranford, NJ, saving lives and fighting to keep his antennas. Photo courtesy of **The Daily Journal**, *Elizabeth, NJ. From* 73, *May '77.*



The sequence of inventions in telecommunications. (From James Martin, Future Developments in Telecommunications, *1971.)*

U.S. Frequency Allocations Chart

It's not as pretty as a land map, but it's even more essential to find your way around electromagnetic territory. The whole allocations table, from 10 kHz to 300 GHz — minus all the footnotes, technical specifications, exceptions, etc. — is presented graphically, using patterns and colors to identify the various services. I must say the colors are harsh — pungent pinks, greens, blues, reds — but that gives the chart an appropriately non-decorative impact. I can't say what exactly I've learned from having it on my wall, but it does keep me aware of how much of the world is beyond direct perception.

—Robert Horvitz

U.S. Frequency Allocations Chart
32" x 55"
$1.35 postpaid

from:
U.S. Govt. Printing Office
Supt. of Documents
Washington, D.C. 20402

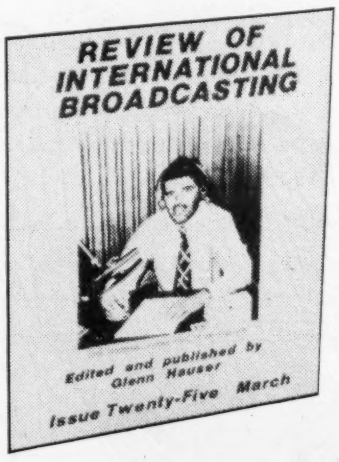
Review of International Broadcasting

The title sounds prim and official, but this is one of the more off-the-wall, uneven, involving magazines I've seen lately. Basically, it's a forum for listener comments on current short-wave and medium-wave programming, most only a few lines long, supplemented with a few 1 - 2 page articles, reprints and features (in the April issue: "Report from the Dominican Republic," "Radio Finland's Repugnant Attitude," etc.). Edited by Glenn Hauser, who seems to sit at the center of the DXers' (long-distance listeners) spiderweb, **RIB** *differs from other short-wave magazines in its emphasis on content. The most valuable part, as far as I'm concerned, is the English-language program guide, compiled by Hauser every other month or so. A good way to tell if you'd be interested in short-wave before you shell out money for a set.*

—Robert Horvitz

Review of International Broadcasting
Glenn Hauser, Ed.
$12/yr., 12 issues

from:
Glenn Hauser
University Radio WUOT
Knoxville, TN 37916



CHINA (Oscar Hansson, R. Viking "DX World," Mar. 13). Advertising on Chinese radio and TV has now been permitted for foreign companies. The prices are very modest — for instance a 15-sec TV ad will cost $640 and a 60-sec radio spot will cost $127. During the weekends the prices are 20% higher.

•

KOREA NORTH (Bob Underdown, AR). Do people actually listen to Radio Pyongyang? They've got my vote for the world's dullest station. Who else can take a short letter from some obscure African political group and turn it into a 25 - 35 minute newscast!

•

NICARAGUA (Tim Hendel, Miami, FL). The clandestine Radio Sandina I heard one night giving a detailed lesson on how to clean, load, and fire an automatic rifle. After the lesson they said something like, "And now, comrades, that you have learned this lesson, go out and kill as many Somozans as you can get to for the glory of the revolution." For those who understand Spanish they should check it out, for some spicy raw first-hand radio.

•

UGANDA (Todd Thompson, Chula Vista, CA). I tuned into UBC the other night (8 March) to hear about the Tanzanian invasion. At 0315 they began playing music, easy listening and modern African. I expected that at 0330 the programme would begin, but it did not. In fact, it never did. They just kept playing the same music tape over and over. This continued until 0430. The signal was excellent and the audio quality quite good: some feat for the UBC. Never did hear a spoken word from them. Either UBC is running tests or things must be getting hot in Kampala.

The Amateur Satellite Corporation

Did you know that the first satellite designed and built by amateurs was launched in 1961? It was called OSCAR I (Orbiting Satellite Carrying Amateur Radio) and didn't do much more than say "hi" (it wasn't a relay), but it began a series of increasingly sophisticated amateur satellites now climaxing in PHASE III, which is tentatively scheduled for launch next spring by the European Space Agency (all amateur satellites have been "piggy-backed" into unused space on other satellite launches).

The OSCARs have allowed "hams" to talk with one another over thousands of miles, as well as conduct experiments with radio propagation, new antenna designs, etc.

If you want to find out how you can use or just listen in on OSCAR, the thing to do is write the American Radio Relay League (see ARRL Publications review for address) and ask them for a pamphlet called "Satellite Communications." It costs $4.75 and consists of a series of reprints from the ham magazine, **QST**, *along with an "OSCARLOCATOR," a small chart with overlays, so you can figure out when OSCAR is over the horizon in your area and where in the sky it is. (Incidentally, the antenna for receiving OSCAR signals is incredibly simple and cheap to make, but you do need a receiver that picks up 10-meter radio signals.)*

If you believe in (or are otherwise bemused by) the idea of amateur communications satellites, the people to contact are the **Amateur Satellite Corporation, Box 27, Washington, D.C. 20044.** *They manage the currently-functioning OSCARS 7 and 8 and are responsible for the PHASE III program. For a $10 per year ($100 for life) membership, you get their quarterly newsletter. If you want to help sponsor the PHASE III in particular (the satellite is costing about $250,000; they say that if it had been built by the aerospace industry it would have cost forty times that much), Amsat is soliciting donations for individual solar cells to power the satellite for $10 each (over five thousand are needed). They won't inscribe your name on the cell, but you do get a certificate acknowledging the gift. Larger gifts go toward the larger components, and if you really drop a wad on them, they'll put a plaque carrying your name on the satellite.*

—Robert Horvitz

Gilfer Associates — FRENDX

I'm not familiar enough with the short wave equipment market to recommend anything specific to you, but one of the largest mail-order suppliers of such things is Gilfer. They carry a wide selection of receivers, antennas, books, station guides, etc. If you want to look over what's available, their newest catalog (No. 26, available without charge) is probably more comprehensive than any store in your area.

Shortwave Catalog No. 26
Gilfer Associates, Inc.
P.O. Box 239
Park Ridge, NJ 07656

And for a more use-oriented guide to equipment, the North American Short Wave Association publishes a monthly magazine called **FRENDX.** *I don't like it as much as* **RIB** *(though they are quite similar and Glenn Hauser writes for both) because* **FRENDX** *is more hardware-oriented, but that may be just what you need. Most every issue has "user reports" about equipment and technical articles about antenna design and radio propagation. To subscribe, you join NASWA, and that costs $13 a year.*

—Robert Horvitz

FRENDX
Bill Oliver, ed.
$13 /yr., 12 issues (includes NASWA membership)

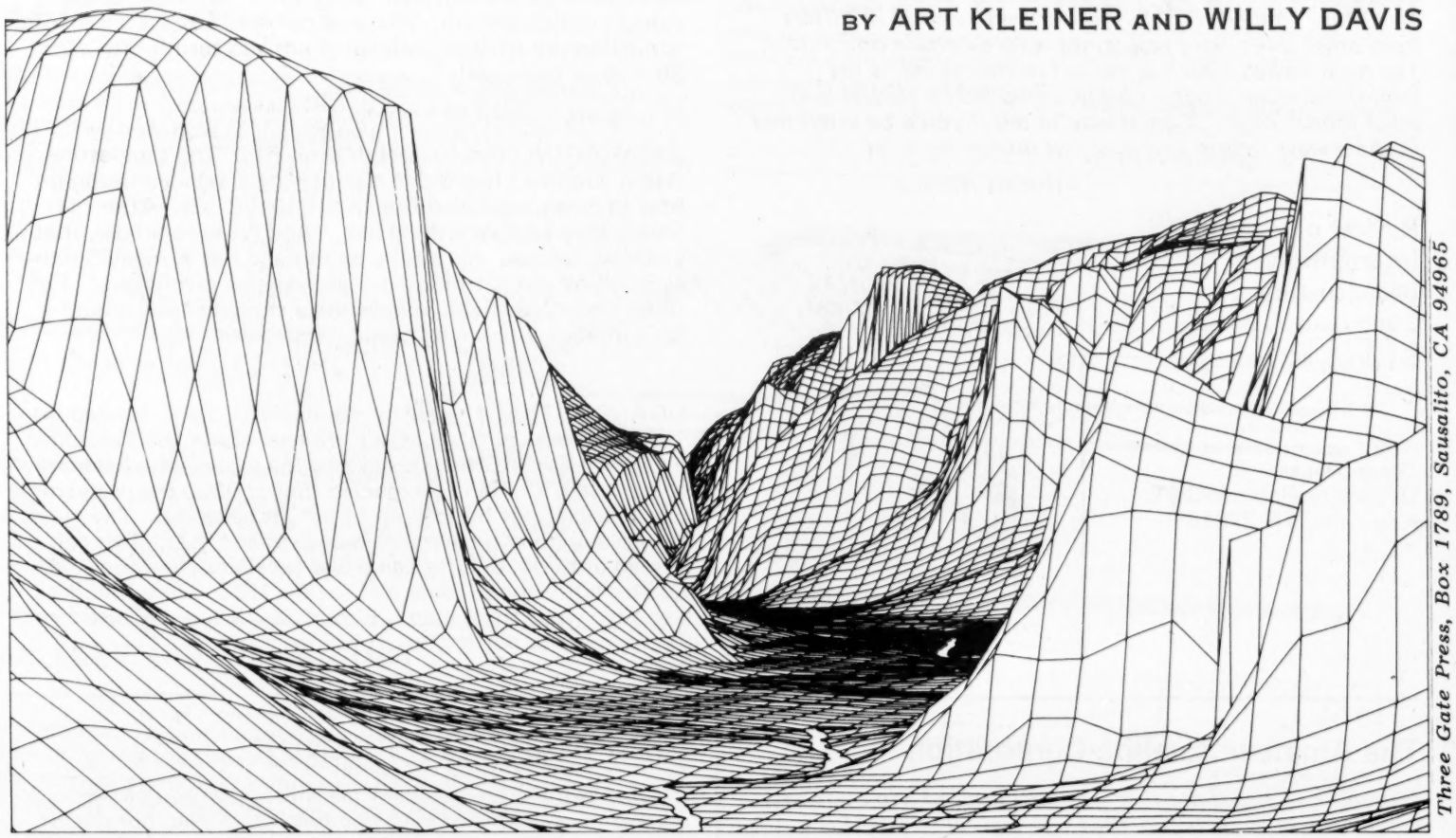
from:
North American Short Wave Association
P.O. Box 13
Liberty, IN 47353

Big time DX can frequently be detected with two receivers which would otherwise be inaudible or useless on a single more sophisticated receiver. At present, this writer is employing a diversity reception method using SX-190 and SP-600 receivers. The technique calls for listening to both receivers at one time through the use of split (stereo) headphones. Each receiver, using its own antenna, is tuned to the same frequency. By channeling one receiver to the left ear and the other receiver to the right ear, a superior sensitivity and signal quality is realized surpassing that available from either receiver used alone. (Edward C. Shaw).

Personal Computer Networks:
Better Than The Next Best Thing To Being There

The telephone transformed American life. It may be happening again.

BY ART KLEINER AND WILLY DAVIS



Three Gate Press, Box 1789, Sausalito, CA 94965

ONE OF THE EARLIEST and most powerful computer dreams, the home electronic information and mail network, is now becoming available to the public in America. Unlike other countries, where telecommunications systems are often centralized, twenty or more separate systems are operating or plan to begin soon in the U.S. Their sponsors range from AT&T, Xerox and Warner Communications to the National Science Foundation and Corporation for Public Broadcasting to grass-roots groups of computer hobbyists. Some computer networks were set up to experiment with the possibilities of the medium; others are limited forms of electronic text aimed at businesses or personal computer owners; still others will compete commercially for the chance to become the next Bell Telephone System.

The recent development of cheap terminals made the dream economically viable. Video-display terminals, most looking like video screens with keyboards, have become available for $500, and are expected to become cheaper. "Smart" terminals, or microcomputers, are generally not much more expensive. Terminals translate typed-in words (and pictures input in a variety of ways) into binary code, which can then be transmitted over telephone lines, wire cables, fiber-optic cable or broadcast waves. The cost is often less than that of long-distance phone service.

Some of the most promising uses include news services edited by computer to peoples' personal needs; elaborate computer-aided fantasy games played with others through the system; computer conferencing; instant

The authors are writing magazine articles/masters' theses about how people are using two-way telecommunications systems. If you have first-hand observations or anecdotes, contact them at 4106 Emerald Ave., Oakland, CA 94609 or (415) 653-7710. They collect such items as these from Art: —SB

"Eighty-five percent of the people who go to public access computer facilities are kids, 8 - 18 years old. There are a lot of teenagers around who are brilliant, creative programmers; they start computer consulting firms or get jobs with software companies. A 17-year-old manages the ARPA-NET hookup at Lawrence Berkeley Labs. At the Marin Computer Center kids are afraid of obviously outclassing adults, so they deliberately play their computing talents down when their parents are around.

"CRT terminals are potentially dangerous sources of x-ray radiation and eye damage. This may not sound like news; but a National Institute for Occupational Safety and Health study in 1977 said computer programmers were safe from radiation. Now, the FDA (or a medical researcher at the FDA) told me they're not satisfied with the way NIOSH tested the machines. CRT terminals are especially dangerous sources of radiation because you peer into them at close range for hours at a time. The communications workers (San Francisco Communications Workers Union: an example of alliance between labor and anti-radiation people), are investigating eyestrain and eye damage now because of complaints from Directory Assistance operators, who have to scan through all those numbers on the terminals. Researching this subject makes me absolutely delighted to be a computer typesetter."

mail; and immediate access to groups of people or libraries of words and film, which are found by specific combinations of keywords. The possibilities were described more elaborately by Gene Youngblood and Paul Baran in the Winter, 1977 (Broadcast) issue of CQ.

As some of these networks evolve into versions of Youngblood's National Information Utility, the political questions are still unanswered: Who controls the networks? Must they be centralized? Who has access to them? How are their contents chosen? How are they paid for? The following is a survey of what seemed to be the leading contenders, plus some influential experiments. We asked the above questions, plus:

What technology is used to transmit messages?

What services are offered?

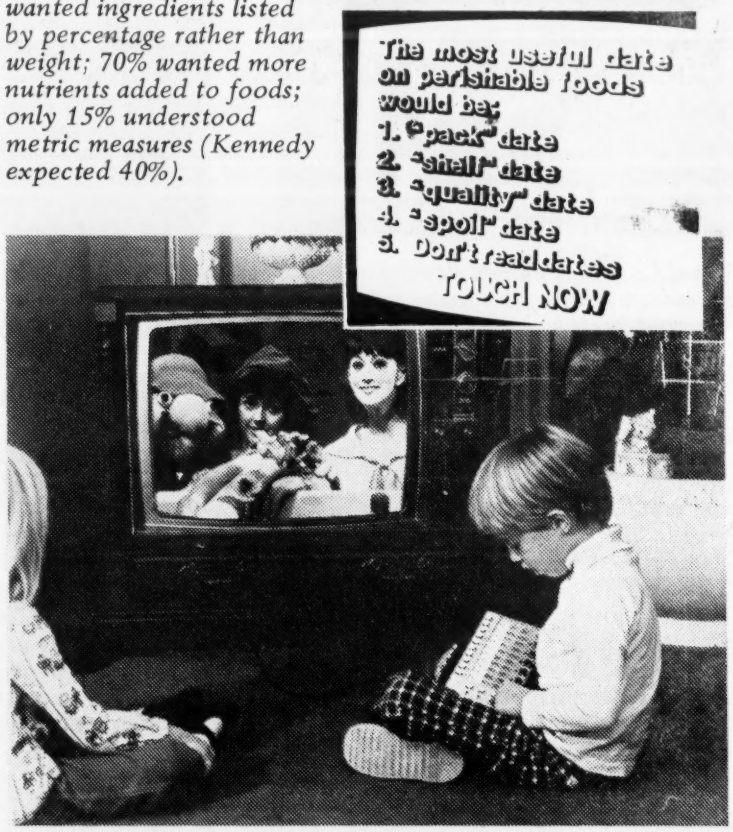
How do users interact with the system? (A rigid network, like QUBE, permits people few choices, but the more interactive systems require sophisticated computer-users who have to learn to make the systems do what they want.)

What provisions exist for privacy? (The technology encourages lack of privacy; networks can be easily programmed to keep records of all transactions within them, and clever programmers can often tap into a system from the outside.)

How to get in touch?

This is *not* an exhaustive survey, but it should give some idea of the range of available networks. Our two-paragraph descriptions are by necessity oversimplified, so wherever possible we've mentioned other sources that go into more detail.

Last October over 3,000 sets were tuned in to QUBE in Columbus to discourse on food labeling with Donald Kennedy, then head of the Food and Drug Administration. Kennedy was surprised at some of the results: more than half the audience wanted ingredients listed by percentage rather than weight; 70% wanted more nutrients added to foods; only 15% understood metric measures (Kennedy expected 40%).



"Pinwheel" being enjoyed by preschoolers in Columbus, Ohio on QUBE, Warner Cable's two-way cable TV service. "Pinwheel" is made up of original videotaped segments featuring puppets, mime, music and dance. "Pinwheel" will be distributed on Nickelodeon, Warner Cable's young people's satellite network, to cable TV operators throughout the nation.

QUBE. Columbus, Ohio; may soon be introduced to Boston and Pittsburgh. Started December, 1977. Sponsored by Warner Communications Corp. Contact: Leo Murray, V.P. Public Affairs, 75 Rockefeller Plaza, New York, NY 10019.

This widely-publicized, two-way cable TV station offers normal cable TV, pay TV and potentially interactive local channels. On interactive shows, viewers push yes/no/multiple choice buttons to respond to opinion polls or order products after commercials. A central computer monitors each TV set every 6-10 seconds, recording responses and what channel the set is tuned to. The system is used for political polls, talent shows, university extension course exams, and commercials with built-in market research that seem to serve Qube's sponsors better than its subscribers.

Warner's research showed people wanted the simplest system possible – hence the limited amount of interaction. "Mrs. Jones doesn't want to take the time to learn to be a computer expert," spokesman Leo Murray said. Qube warns viewers in advance when their responses are recorded, and doesn't release records without subscribers' consent, he said. They expect to introduce video games, security systems and electronic funds transfer directly from subscribers' bank accounts to stores. March 1979 articles in **Atlantic** and **Penthouse** go into more detail.

To connect you need: a TV, $19.95 one-time installation charge, and $10.95 monthly rental. Pay-TV programs average $1 - $4 each.

VIEWDATA. A British consumer system, available sometime in 1979 in America as a business service. Sponsored by Insac Viewdata, Inc., a subsidiary of the British National Enterprise Board, which also owns Leyland Motors and Rolls Royce.

Viewdata is a type of interactive text system developed by Insac and operated by the British Post Office under the name Prestel. A Prestel terminal is an adapted TV set with a telephone connection and a remote-control switch box that looks like a pocket calculator. Viewers press numbers to call for pages of travel information, business information, retail advertising, or constantly updated news. Pages appear on the screen in bright colors and block letters; each page includes a list of 10 other pages that can be called up for more information, like a cross between a library and a chain letter. Sometimes people must go through seven or eight pages to reach the one they want. News agencies and advertisers pay the British Post Office for the opportunity to put their messages on the air. More detail in the Spring 1979 issue of Dell's **Video** magazine.

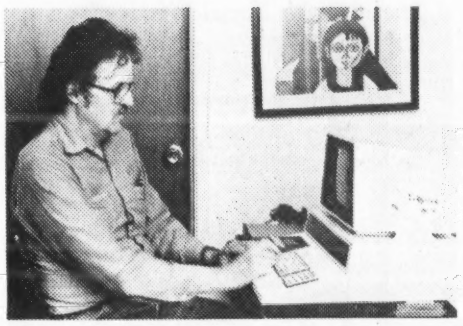
To connect, British viewers need an adapted TV ($30 - $50 more than a regular TV, according to **Video**); plus the price of a phone call. Each page carries a charge, usually 1¢ - 4¢.

Several companies will offer variations on Viewdata in America.

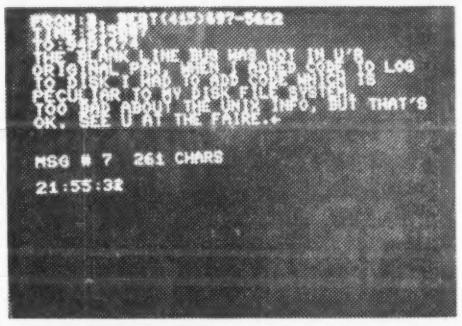
Insac, the parent company, will not offer the service publicly, but hopes to find businesses or broadcast stations that will establish closed Viewdata systems for their members or clients. These groups will make all the decisions about what information to use, how to present it and how much to charge. For more information: Martin Lippman, VP, 277 Park Ave., New York, NY 10017.

The Knight-Ridder newspaper chain will test a home Viewdata system in Miami beginning in 1980, spending about $1.3 million to do so. Contact: Viewdata Corporation of America, One Herald Plaza, Miami, FL 33101.

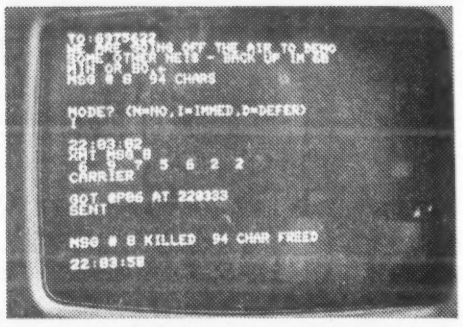
KSL-TV, Salt Lake City, has an experimental demonstration system now; a public system is subject to FCC approval. Service is at least two or three years away. Contact: Bill Lovelace, Director of Engineering, 145 Social Hall Avenue, Salt Lake City, Utah, 84111 "(Station owner) Arch Manson went to London," Lovelace said, "came back and said, 'Why can't we do that?' " Texas Instruments would manufacture terminals, costing $30



Dave Caulkins, PCNet developer, demonstrating on his home personal computer. It's connected to outside networks through that phone just behind it.



A message from Bonnie Best, Dave's colleague in a nearby city. The network keeps statistics on how many messages sent and how many characters in them. "The Faire" is the West Coast Computer Faire, which happened May 9 in San Francisco.



Step-by-step, Dave types in Bonnie's phone number and sends her a message. The program asks "Mode?" meaning: Hold on to it (N), Send it now (I), or Send it at a certain time (D)? As it dials her number, the program types those spaced-out digits. Then it tells Dave his message is sent ("Carrier"), received ("Got . . .") and deleted from his own computer ("Killed"). It always keeps track of the time at the very bottom. It also lists, upon request, the messages received and those waiting to be sent.

more than a normal TV if a million are sold. The **L.A. Times** wrote up the system on March 19.

ALTERNATE MEDIA CENTER TELETEXT STUDY. Funded by the Corporation for Public Broadcasting. Contact: John Carry, New York University Alternate Media Center, 144 Bleecker Street, New York, NY 10012.

Teletext resembles Viewdata visually; but it's a constant stream of text and pictures broadcast over a TV station, each piece of information coded with preselected keywords. Users program their terminals to catch only those items of personal interest as they whiz by. "We see our Teletext as a large-scale system for the public," Carry said. "Maybe four or five years from now the price will be low enough." In the meantime, the Corporation for Public Broadcasting paid for research into possible uses of Teletext for people overlooked by the mass media, such as neighborhood associations and the handicapped. Last year, Alternate Media Center organized the highly successful Berks County, PA, community interactive TV system, in which senior citizens and community members use TV cameras, cable TV and telephones to make an electronic community out of their county. Now they hope to raise funds to demonstrate their Teletext system in Washington, D.C. sometime next year.

Teletext systems are currently operated by TV networks in Britain under the names *Ceefax* and *Oracle*.

DIGICAST. San Francisco, beginning sometime 1979. Proposed by the Digicast Project, an informal group of computer scientists, engineers and electronic manufacturers. Contact: Jim Warren, 345 Swett Road, Woodside, CA 94062.

Like Teletext, Digicast will transmit words and pictures over broadcast waves in a steady stream. Using Sub-Carrier Authorization channels, which are unused FM frequencies linked to existing radio stations, Digicast will be a steady stream of news, financial data, real estate listings, classified ads, weather, computer programs and library resources. To receive it, users will need a modified personal computer ($600 - $1,200) with a radio receiver ($100). As in Teletext, the computer will pull out only those items which it has been programmed to catch. Digicast will be free; but project members will start businesses to make terminals, sell advertising, or produce the information. Organizer Warren is known as the founder/editor of several computer hobbyist magazines, one of which, the **Intelligent Machines Journal**, carries news about Digicast.

PCNET (PERSONAL COMPUTER NETWORK). Nationwide. Available from the PCNet Committee. Contact: David Caulkins, coordinator, 340 East Middlefield Avenue, Mountain View, CA 94043.

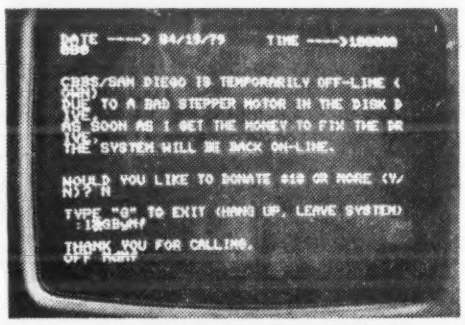
Caulkins wrote a **CQ** article several years ago when PCNet plans were still tentative; since then, his committee of volunteers have developed an electronic mail system for Commodore Pet personal computers over telephone lines. Most of the work involved developing a program which directs computers to dial each other's numbers to leave messages in other computers' file, and to correct the large numbers of errors caused by garbled phone-line transmission. An ingenious method of bouncing messages from one computer to another helps avoid costly long-distance phone rates. Pet computers with telephone connectors (modems) cost about $1,100; users feed PCNet programs (about $8) into their computers. There is no central switching computer. "That's our political decision," Caulkins said; decentralized networks are harder to control. To protect privacy, users are encouraged to develop automatic message-encoding programs. Future plans include adapting other microcomputer brands and sending the messages over short-wave radio. **Personal Computers** magazine's Oct.-Nov. 1977 issue carried a long description by Caulkins of how the system would be used.

THE COMMUNITY MEMORY PROJECT. San Francisco, beginning sometime 1980. Sponsored by the Community Memory Project. Funded by contributions. Contact Sandy Emerson, 1814 Ward St., Berkeley, CA 94703.

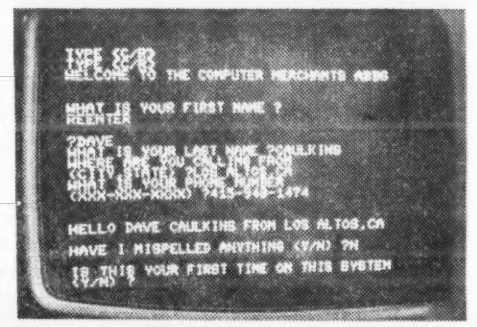
Convinced that computer networks should be decentralized, open to everyone, and service/community-oriented, Community Memory put interconnected terminals in Berkeley public places between 1973 and 1975. People used them as an electronic bulletin board for filing news, messages, classified ads and poetry. Others used the terminals to pull out information with the appropriate keywords, or to add comments to existing messages. A new, similar system will be established in a San Francisco neighborhood; up to 20 terminals will be placed in community centers and neighborhood gathering places. All information in the system will be entered by the people who use it. As an experiment, high-tech users accustomed to home terminals will find it limited and inconvenient, but it's one of the few systems that doesn't require people to own their own terminal in order to use it.

THE SOURCE. Nationwide. Unveiled at the New York Computer Fair, June 2, 1979. Available from Telecomputing Corporation of America, itself a subsidiary of Digital Broadcast Company, "one of the most heavily capitalized ($34 million) companies in the history of this country." Contact William von Meister, chairman of the board, 1616 Anderson Road, McLean, VA 22101.

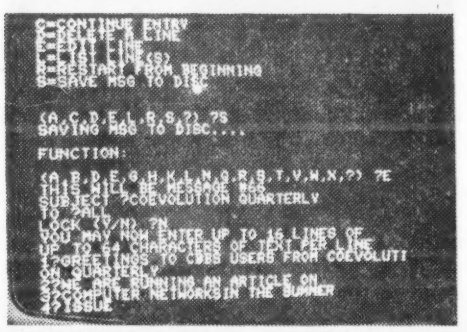
This is the first home-terminal consumer information network put on the market in America, and probably the most ambitious. People with home terminals will call for specific information, including any UPI article of the last 7 years, programs in Cobol, Basic and Fortran, airline information and video games. In addition, the Source will offer electronic mail to other terminals, and a unique electronic mail system to people without terminals — for 75¢ your computer message becomes a Western Union mailgram dropped off at O'Hare Airport. All this will be transmitted over **Telenet**, a private data communications cable



There are a number of computer bulletin boards in U.S. cities where home computer owners can leave and take messages. Dave calls one in San Diego.



. . . and one in Chicago, which is working. . .



. . . and leaves a message from CQ. *Those codes at the top are the commands for using the bulletin board. The program types a question mark whenever the human is supposed to do something.*

network more suited than telephone lines to computer signals.

All information on the data banks is chosen by the company, based on customer demand. Some services are paid for by advertising. People can send one message to a group of others — everyone interested in alternative energy in Virginia, say — for 15¢ per recipient. News services would be censored only because of "irresponsibility of editors — four-letter words," von Meister said. What about for political reasons? "You know we wouldn't." Records are kept of how much each piece of information is called up, but not of who is calling for what. DBC offers a $5,000 reward to anyone who can break into the system.

To connect, you need a personal computer and telephone hookup ($1,100) or a data terminal ($495 and up), plus $2.75 per hour of use. The service is limited to off-business hours and weekends, when Telenet rates are cheaper. The cheap cost is a big selling point; "There's no reason we shouldn't be within 10% of the nation's homes in five years," von Meister said.

ELECTRONIC INFORMATION EXCHANGE SYSTEM (EIES). Nationwide, begun October, 1976. Funded by National Science Foundation; organized by Murray Turoff, New Jersey Institute of Technology, and Starr Roxanne Hiltz, Upsala College. Contact: Turoff/Hiltz, Computerized Conferencing and Communications Center, New Jersey Institute of Technology, Newark, NJ.

Early government computer networks, such as Arpa-Net (Department of Defense) and EMISARI (Office of Emergency Preparedness), brought scientists and social scientists together electronically to collaborate on government research. These networks planted seeds for later, more experimental networks whose purposes center around developing the form of computer communication itself. Along with Forum/Planet (started at Institute for the Future, Menlo Park, CA; now managed as a business network by Jacques Vallee's Infomedia Corporation) EIES is probably the most influential in developing social contexts with which people will find each other through computers.

EIES messages travel over Telenet; EIES is a system of subnetworks, each centered around an interdisciplinary research topic such as Futures Forecasting or General Systems Research, each with up to 1,000 members. Members collaborate on research, send cross-messages and immediate responses, introduce themselves to each other via keywords that signal common interests, and gradually build up on-line libraries of relevant information. A microprocessor is being programmed to search data bases at the request of EIES users, and the frontier seems to involve communication with or through computers that develop an independent identity — either terminals that act as extensions of their owners when they're not at them, or computer programs that simulate personalities and social systems.

To connect, you need to apply at the address given above. Limited funding is available for a three-month trial period; otherwise, people with a reasonable idea for using the system can buy membership slots in areas of special interest for $66 monthly and $3.75/hour (cost of Telenet). Groups can buy a slot cooperatively. For $100,000 a group can buy the hardware to create their own EIES-like system. Software and maintenance is extra. More detailed information is available in articles by Turoff and Hiltz (the best, perhaps, in the **IEEE Spectrum**, May 1977), or in their book **The Network Nation** (reviewed later).

One subnetwork is actively exploring the possible uses of computer networks in neighborhoods and local communities. Participants include the Institute for Self Reliance, some members of Robert Theobald's Linkage System, **Rain** Magazine, and Peter and Trudy Johnson-Lenz, EIES researchers who organized a neighborhood computer network outside Portland, Oregon several years ago. For more information contact: Johnson-Lenz, 695 Fifth Street, Lake Oswego, OR 97034.

PANALOG. Started December, 1977. An informal group of information scientists based at General Telephone and Electronics Laboratories in Waltham, MA. Contact: Ed Housman, GTE Labs, 40 Sylvan Rd., Waltham, MA 02154.

Housman used excess computer time on the GTE computer to establish his own informal computer conferencing network. Members of the network, mostly members of the American Society for Information Science, have used it as a research bulletin board, for entering messages and responding to them, on the subjects of information theory and the office of the future. Informal networks for the deaf and for teenagers were also set up on the same system. It was written up recently in **Basis**, the Bulletin of the American Society for Information Science.

ADVANCED COMMUNICATIONS SERVICES (ACS) Nationwide. Subject to FCC approval. Proposed by American Telephone & Telegraph. Contact: Marguerite D'Amico, Media Relations Supervisor, 195 Broadway, New York, NY 10017.

XEROX TELECOMMUNICATIONS NETWORK (XTEN) Nationwide. Subject to FCC approval. Proposed by Xerox. Contact: Sandy Lanzarotta, 701 South Aviation Boulevard, El Segundo, CA 90245.

Xerox and AT&T are both proposing data communications networks on a grander scale than phone lines or private wire networks. Trade magazine **Datamation** described ACS as a giant amoeba, swallowing smaller networks in its path. ACS signals would travel over a network of cable and switching computers; XTEN would use satellites to transmit radio frequencies of 10 gigahertz, near the electromagnetic border between radio waves and micro waves. Both propose elaborate systems which would accept many different types of terminals and computer hook-ups, provide electronic mail and conferencing, rent computer programs and store data. XTEN would also transmit voices and facsimile documents. Both are aimed at businesses, which would establish their own closed subnetworks within the larger system, but both ACS and XTEN could be adapted to home use and presumably would be if there were enough demand. Anti-trust regulations may prohibit ACS, because AT&T is not allowed to sell data processing. It is also not certain what effect XTEN's radio waves would have on public health. We found no non-technical articles about these systems, but trade magazines like **Datamation** and **Infosystems** have reported on them since last summer.

Other companies that may develop telecommunications networks:

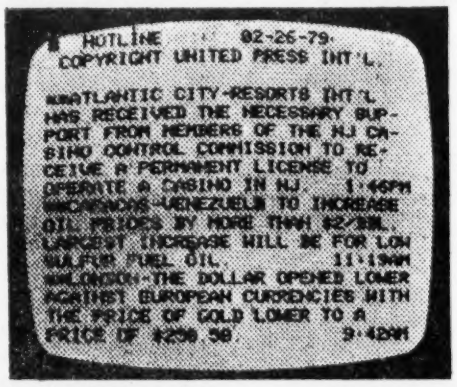
SATELLITE BUSINESS SYSTEMS, part-owned by IBM (see "Publisats vs. the Oligoposat," Winter '77 CQ);

GENERAL TELEPHONE AND ELECTRONICS, which has petitioned the FCC for permission to buy the common carrier Telenet;

EXXON, rumored to be planning a network based on laser-light particles transmitted through fiber optic cables. Exxon's public relations office will not comment on any future plans.

The Xerox Telecommunications Network (XTEN) will employ leased satellite capacity, radio links and communications processing capability. Typically, a customer's message will move from his terminal through Xerox-supplied equipment interfaces on his premises to transceivers linked to a rooftop antenna (1). From there, the message will be beamed to a sub station or city station (2) and then to an earth station (3) for transmission to a satellite (4). At the destination site, the message will travel a reverse path to the receiving terminal. At the customer's option, documents, messages and data will also be transmitted to a network control center (5) where they will be recorded for subsequent retrieval.

You can get the weather any time on Britain's Ceefax, from the BBC.



Wire service news (UPI) and stock prices on the Alpex 900 Network (Alpex Computer Corp., Ronald W. Cains, Commerce Park, Danbury, CT 06810).

THE EMERGENCE OF computer networks puts the Federal Communications Commission in the middle of a complex tangle of regulatory questions, including the uncertainty of its own survival. The 1934 Communications Act, which created the FCC, separated regulation of broadcasting from that of telephone communication, a decision evolved from the conflict between rail travel and the telegraph in the 1800s. As computers developed, the FCC chose not to regulate them at all; and new digital technologies threatened the AT&T monopoly over person-to-person communications. Now the FCC is faced with the problem of defining what is communication and what is data processing.

According to Gary Rosch, an attorney with the FCC's International and Satellite Branch, FCC commissioners are concluding an inquiry into the relationship be tween computers and telecommunications. Their intention is to encourage competition and restrict communications networks from dominating computer services. Based on this inquiry, the commissioners will decide which FCC-regulated computer/communications systems can offer which types of services. At stake is the choice between one, centralized communications system, or the growth of many smaller overlapping and competing networks. In the meantime, the currently-being-rewritten Communications Act could abolish the FCC or reorganize its powers entirely.

Will computer networks make people happy? Their eventual effect on people and society is not certain, but there are some preliminary observations:

- Despite the enthusiasm of proponents, there's lots of doubt that the public is interested enough in two-way electronic networks to spend much time or money on them. No consumer computer network has yet shown signs of being a great commercial success. However, networks which see themselves as alternatives to "commercially generated and corporately controlled information" (Community Memory brochure) hit pockets of enthusiastic response from people who aren't satisfied with the straight media.

- Lots of electronic mail ends up being as personal as face-to-face talk. People form friendships, have arguments, crack jokes. Good writers and more literate people have the same social advantage that good-looking people have face-to-face.

- A two-way videoscreen is not nearly as hypnotic as one-way TV, because communicating back requires rousing oneself from the video trance.

- The old problem of computers being more exact and consistent than people makes it hard for people to find specific information sometimes. No index system can anticipate all the ways people can refer to something. Peter and Trudy Johnson-Lenz, researchers on the EIES network, suggested the development of information shepherds – a cross between directory assistance operators and reference librarians, who keep the indexes coordinated and direct people to the proper keywords.

- People get overloaded with electronic information because access to it is so easy. One response, developed by Johnson-Lenz, is programming one's terminal to sort through the incoming mail/data and display the most important stuff first. Another response is not using the system so much. People who belong to more than one network often find it hard to keep up.

- Uneducated or disadvantaged people may be deprived of opportunities if they can't get access to terminals or learn how to use them. However, if they do get access, much of the subconscious prejudice against minorities, women, the young and old, disappears.

- Words and numbers are easiest to translate into digital signals; but the following can also be transmitted through computer networks with the proper terminals: music and sound, line drawings, halftones, video, animation, mechanical vibration and facsimile reproduction.

- There is great potential in commerical networks for substituting interactive video experience for "real life." Thus far, however, we haven't found any examples of anyone who has done this. ■

The Wired Society and The Network Nation

Both books are directed at the general public, those who until now have been unaware of computer networks. Network Nation *is also a college textbook. Both cover a lot of possible ramifications — social effects, effects upon people, changes in business, medicine, social welfare — and as such are good introductions to the issues involved.* Network Nation *is more useful in getting a complete picture, but* The Wired Society *is more readable. Both, written by proponents of communications networks, are enthusiastic sometimes to the point of being sales pitches.*

The Wired Society *is colorful and slickly written, but frustrating when it avoids specifics. I kept scribbling, "Where? When? How much did it cost?" in the margins. It's not a good introduction to personally getting involved with computer communications, because there are no names and addresses people can contact, and only the most general references to what's going on today. But it's good as a well-organized picture of what's going on. Martin has written other books for more technically-educated readers.*

The Network Nation *is admirably thorough and does refer to specific networks. It gives a much more realistic picture of what they are being used for now, and although its authors organized the EIES network, there is lots of information about other networks as well. It's invaluable to anyone seeking to understand computer conferencing in particular. The examples of particular messages sent over EIES are always interesting, even when they're silly and academic (which they aren't always). Drawbacks: it's very densely over-written in places, and way overpriced.*

—Art Kleiner

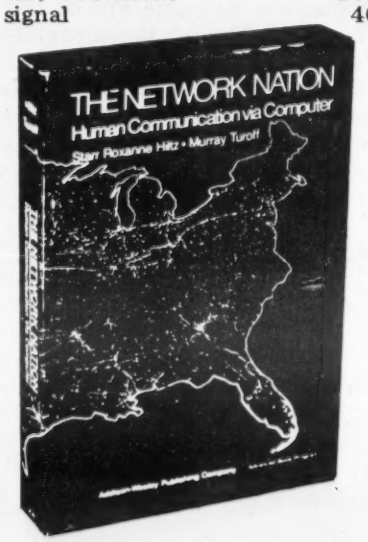
The Wired Society
(A Challenge for Tommorow)
James Martin
1978; 289 pp.
$12.95 postpaid

from:
Prentice-Hall, Inc.
Box 500
Englewood Cliffs, NJ
07632
or Whole Earth

It is possible to convert any type of message into a digital form for transmission. Different messages require different numbers of bits.

	Message Type	Bits
1.	A high-quality color photograph	2 million
2.	A newspaper-quality photograph	100,000
3.	A color television frame	1 million
4.	A picturephone frame	100,000
5.	A brief telephone voice message (voicegram)	1 million
6.	A brief telephone voice message with complex compression	100,000
7.	A voice message of codebook words	400
8.	A document page in facsimile form	200,000
9.	A document page in computer code	10,000
10.	A typical interoffice memo	3,000
11.	A typical flip chart	1,000
12.	A typical computer input transaction	500
13.	A typical electronic fund transfer	500
14.	A typical telegram	400
15.	A typical airline reservation	200
16.	A coded request for library document	200
17.	A fire or burglar alarm signal	40

—The Wired Society



The Network Nation
(Human Communication via Computer)
Starr Roxanne Hiltz and Murray Turoff
1978; 493 pp.
$17.50 postpaid

from:
Addison-Wesley Publishing Co., Inc.
Jacob Way
Reading, MA 01867
or Whole Earth

High and Low Politics

Three long Harvard-originated studies on the politics of telecommunications: one on the battle between the U.S. telephone system and other communications networks; one on the role of the FCC in drawing the line between data processing and communications; one on the international telecommunications scene, and U.S. foreign policy in particular. Generally, dense and technical. Everyone agrees U.S. regulatory policies on telecommunications are a mess; this book was necessary for me to begin to understand them.

—Art Kleiner

High and Low Politics
(Information Resources for the '80s)
Anthony G. Oettinger, Paul J. Berman and William H. Read
1977; 235 pp.
$17.50 postpaid

from:
Ballinger Pub. Co.
Order Dept.
East Washington Square
Philadelphia, PA 19105
or Whole Earth

Rules for Using the Telephone — Circa 1909

1. Each person renting a phone shall accept the same subject to the by-laws of the company and such regulations as may be fixed by the company from time to time.

2. Social conversations are not permitted when the line is required for the transmission of business messages.

3. No one shall use the line for more than five minutes if another is waiting for it. Anyone failing to surrender the line in five minutes after being requested to do so shall be charged the sum of $.25 for each three minutes and at the same rate for any extra time over.

4. Any and all persons using party lines shall, upon notice that there is a long distance message to be transmitted, immediately surrender the line, and in case of failure to so surrender, each of said parties using the party line shall pay $.25 for each three minutes and at the same rate for any time over three minutes.

5. No one shall be allowed to use improper language over the line and any person so offending shall be charged $1.00 for such conversation over the phone and will also be liable for prosecution for violation of the law.

6. No one shall be allowed to take down the receiver for the purpose of listening to a message not intended for him. Each person so offending shall be charged $.25.

7. No one shall allow anyone but members of his family, invited guests or other subscribers to use his telephone free of charge. All subscribers allowing messages from their phone by parties not authorized to talk free will be charged with the conversation (10 cents) and shall be required to collect the same and turn it over to the telephone company at the end of each month.

—High & Low Politics

Here is an example of a request that explicitly recognizes the tendency toward dependency on the system:

OK Murray,

You invented this damned system. You know fully what the potentials are for trapping young innocent minds like ours into a vicious addicted circle of sending messages and hungrily waiting at the keyboard for the response. So you shouldn't be surprised to find us knocking at your terminal once again, asking for more computer time — please, please more computer time. We have only a few more hours left before we fall away into the cold abyss of "your allocation has expired." Quick, we need our August fix so we can continue collaborating with Barry Wellman on the INSNA network, participating in the C117 therapy group, participating in the NCSL demo tomorrow, showing EIES to the emerging new regional science resource network, and contriving more seductive phrases and paragraphs to entice even more young innocent minds into the perverse practices of CC. Have you ever read the article titled, "In Each of Us a Monster Dwells"?

Your hopelessly addicted friends,

—The Network Nation

Computer Paranoia Cuts Both Ways

by Dirk Hanson

A report compiled for the business community by Stanford Research Institute's Business Intelligence Program has this to say: "The reason (distributed processing) computer networks will not be available to the general public at an earlier date is primarily one of security. *At present, fraudulent input or access to a data base management system cannot be prevented.*" (Italics mine.)

This is a vital piece of information that the industry does *not* want you to know. There's this security problem. Large, flexible time-shared computer systems are swiss cheese. Ask a programmer. Computer crime is a growth industry. Computer security is a myth. For every new data encryption system, there's a programmer out there somewhere who can crack it. A program that sneaks you into an operating system is called a Trojan Horse. At most computer centers, the Trojan Horse is already inside the gates.

Some grim worst-case scenarios might just be floating through corporate corridors these days. Striking British civil servants recently turned off key government computer systems, and the result was chaos. Some of the information and assets probably will not be recoverable. The strikers simply pulled the plugs. Crude, but effective.

But what about the likelihood of more sophisticated guerilla tactics, as computer know-how spreads throughout the populace?

Quite a quandary for industry people: They want you as a customer, but can they trust you? They need to sell you computers and teach you the mechanics of programming, but they don't want to let you *too* far into the distributed processing loop. They need your business, but they're scared of you. No kidding. As time goes by, you could become too smart for their own good.

Computer paranoia cuts both ways. The industry may be nervous about widespread consumer participation in future networks, but it seems much less concerned about consumer privacy abuses in current systems. It's common knowledge – at least it *should* be – that information which goes into such systems, information about you, your habits and activities, information from which your preferences can be deduced, is accessible to almost anyone. Credit records, criminal records, medical records, driving records, financial data – the whole gamut. Right now, most of it is fair game.

It's a muddy affair. Who decides who gets access to what? There's reason to be wary of controls and limitations on access to digitized information, and equal reason to worry about what will happen if there are no such controls. The deciding *in theory* will be a sociopolitical matter; the accessing *in truth* will be by those who know how. And the *what* being accessed will be almost everything. ■

The Telephone Book

Ma Bell isn't all that popular with many folks, but you have to admit one thing; the phones work. Delivering the goods is not a hallmark of most big corporations. Why is the phone company different? In this elegant book, a company man tells the expected one-sided story, but he does it well and I found some interesting things to think about. It isn't merely a corporate history. Two things stand out: the men who built the company were quite extraordinary, and they made some very far-reaching decisions at a time when it was not at all obvious what would be the best thing to do. The personalities were important. We tend to forget that these days. Bell was powerful and altruistic to an extreme. His main motivation was helping the deaf, and he put much of his time and effort into that. Altruistic endeavor led him into many fortunate "coincidences," as it often does. Watson retired from the phone business at the ripe old age of 27, put 27,000 people to work in a shipyard he built to alleviate local unemployment, went on to become a famous Shakespearean actor, and died a landscape painter. Theodore Vail, the first company president, made the fateful decision not to sell hardware but rather sell service instead. He reasoned that hardware would be profitable only if it could meet competition prices, and that would force it to be built at a quality level which would jeopardize the system's reliability. That is a philosophy that I think more business might well follow. If you can get by full-color portraits of Princess phones, you'll also find out how Bell managed to fend off those who tried to rip him off, how he got the phone system accepted by the public, and lots of other things it might be good to know for our own enterprises. Worth a look for sure.

—J. Baldwin

The Telephone Book
H. M. Boettinger
1977; 192 pp.
$30.00 postpaid
from:
Riverwood Publishers, Ltd.
c/o E.P. Dutton & Co., Inc.
Two Park Ave.
New York, NY 10016
or Whole Earth

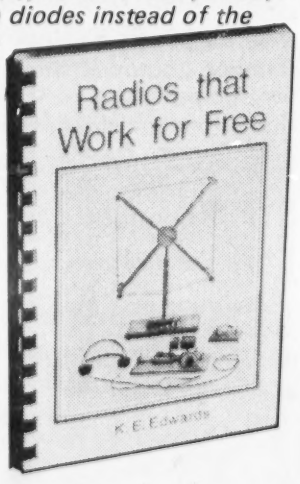
Vail in the 1910s.

Radios that Work for Free

How many of you have had a crystal set radio? Not many I'll bet . . . mine (about 1940) drove me bananas because when I was listening to "Gangbusters," a forbidden fruit in our family, the gunshots at the finale would cause the catwhisker to jump off the crystal, and I'd never find out whodunnit. Anyway, this book elegantly tells how to construct one. Though the author tells how to make the battery by sticking electrodes into a lemon (!), he isn't fuddyduddy. There's a lot about utilizing modern diodes instead of the crystal and catwhisker. I found the whole business possessing a strange esthetic. It's presented nicely too.

—J. Baldwin

Radios that Work for Free
K.E. Edwards
1977; 147 pp.
$5.50 postpaid
from:
Hope and Allen Pub. Co.
P.O. Box 535
Belmont, CA 94002



A 1908 Telephone advertisement proclaiming Vail's policy of Universal Service.

The Portuguese proverb, "God writes straight with crooked lines," defines the pattern of events in Theodore Vail's apparently random activities between his retirement from the telephone business at 42 and his return in 1907, at 62. Everything he did and learned in those years tempered and prepared him for the heroic tasks awaiting his talents. Vail mastered the *craft* of management and now used it to realize a *personal* vision. In this realm, he is more akin to a great artist than to our stereotype of a cold, professional bureaucrat. The intellectual and human aspects of his grand design remain the foundation structure of telecommunications in our day.

These radios work for free, that is, you don't have to plug them in, nor do you put batteries into them. So, where does the power come from? The power comes from the broadcast station who is transmitting.

•

You can find air variable capacitors in all radio receivers, whether they are transistor or tube. We prefer the older tube type radios, broken, of course, for getting your capacitors. The reason is that newer type receivers are built with size as a major consideration and to cut down on the bulk, they use small capacitors that are spaced with plastic film. These are hard to mount and are not nearly as rugged as the older types.

•

If we employ used air variable capacitors, sometimes they are very dirty and should be cleaned. They should also be checked for shorts. To clean them, put a tablespoon of fabric softener into a pot of boiling water (enough water to cover the capacitor) then place the capacitor into the pot for about 10 to 15 minutes. When you remove them, they will be like new. Remove while hot, shaking the excess water off and set aside to dry. Then lubricate the bearings and brass brushes with petroleum jelly or light oil.

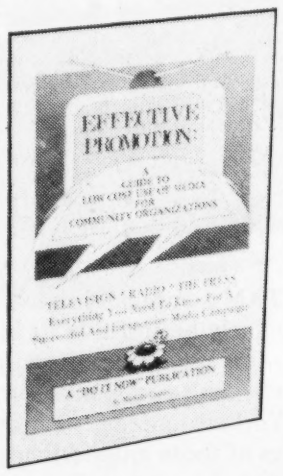
Effective Promotion

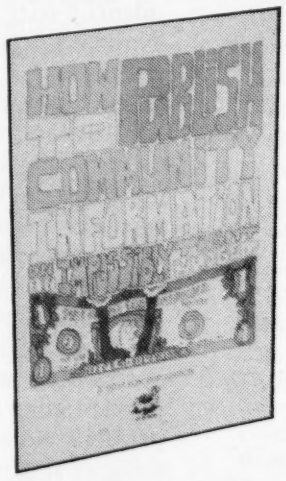
How to Publish Community Information On An Impossibly Tight Budget

What people haven't heard about they can't decide about or take action about. Uncommunicated issues don't exist. For local broadcast on the quick & dirty & cheap, here's two quick, dirty, cheap, and excellent pamphlets of how-to.

—SB

Effective Promotion
(A Guide to Low Cost Use of Media for Community Organizations)
Michelle Cauble
1977; 22 pp.





How to Publish Community Information On An Impossibly Tight Budget
Vic Pawlak
1976; 23 pp.

$.50 each

both from:
Do It Now Foundation
Institute for
Chemical Survival
P.O. Box 5115
Phoenix, AZ 85010

In general, gaining access to media depends on your own personal development of important skills: cultivating personal contacts at newspapers and stations; working on a friendly basis with the local media professionals; learning your local media by format and audience; presenting yourself and your issue or interest in such a way as to attract, rather than distract, the media; being fully informed on the issues yourself; understanding the proper TIMING for releases, conferences, PSAs and so forth; learning what is newsworthy and interesting to the public; and — of great importance to the success of any media effort — coming on coolly, competently, and profesionally, knowing what you're doing. Don't be afraid of the media . . . they rely on you for information.

—Effective Promotion

•

The biggest single mistake most people make in designing a brochure or publication is not using a standard size. Unless it is somehow a multiple or division of 8½ x 11 or 14, you will probably get ripped off. For example, a brochure that is 9½ x 12 will cost a lot more than 8½ x 14 even though it is relatively the same number of square inches of paper. This is because the company must cut up larger sheets that are also multiples of 8½ x 11 or 8½ x 14, and you pay for the wasted odd pieces. A standard size for offset paper, for example, is 23 x 35, which would cut down to 8 sheets of 8½ x 11 paper. Other types of paper have various basic sizes. Always check with your supplier before ordering odd sizes.

—How to Publish . . .

GOOD MOVIES

BY
SHEILA BENSON

MANHATTAN is engaging, audacious, almost sublimely beautiful in its black and white – an easy film to be stuck on. Woody Allen's comment is on just how New Yorkers louse up their lives and the lives of those around them by moral equivocation and surface busyness designed to protect them from uncomfortable truths. But it's a rock wrapped in a love poem, and the most rounded, benign, perfectly-realized Allen film yet. Its purest moment of cinema is the planetarium scene where Gordon Willis' camera places Allen and his best friend's lady, Diane Keaton, rim-lit against a moonscape. As we watch, the two become lovers mentally although they have not so much as brushed hands. Every performance is a joy, but the cool certain ardor of Mariel Hemingway must be singled out.

☆

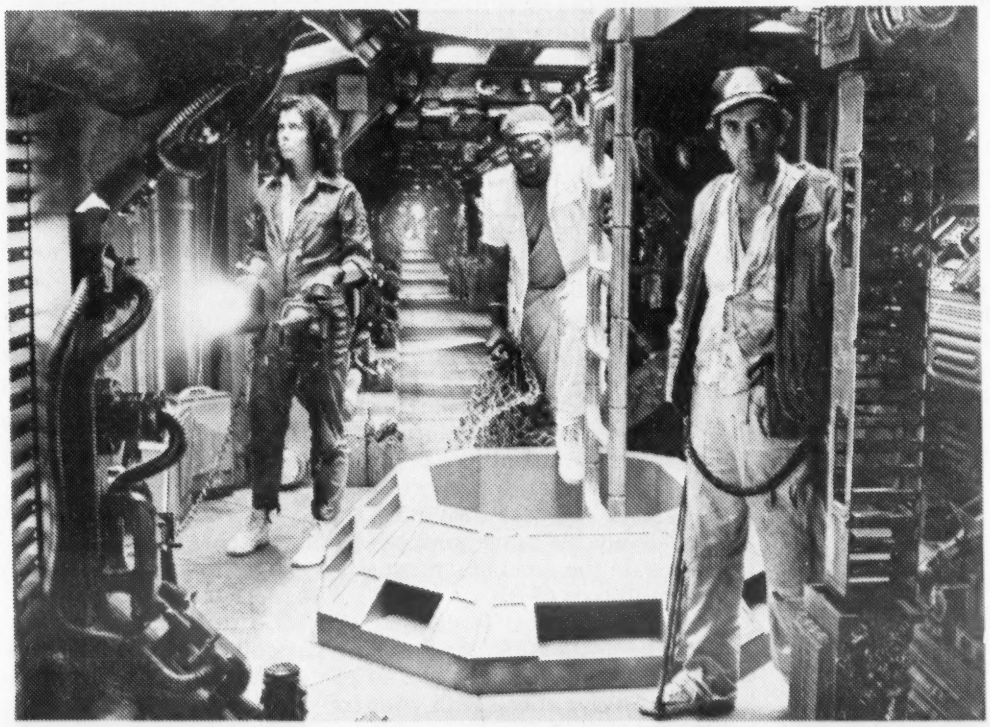
If **Manhattan** is a high water mark of its kind, at the other end of film experience, the visceral clutcher, stands an equal milestone: **ALIEN** is an exhausting exercise of the purest, most unrelenting terror I've ever felt from a film. In his second feature film, director Ridley Scott (**The Duelists**) has gone straight to the heart of the space film dilemma: who can identify with astronauts? But the Nostromo's space freighter crew, a real, rumpled, sweating collection of men and women are easy – they're us. It's the frailest little story, actually an extended search, but Scott orchestrates his knowledge of some of our most basic fears (of things behind us, of being naked against an adversary, of having our bodies penetrated) in an excruciating manner. His cast, including Tom Skerritt, John Hurt, and an actress who may be the next Jane Fonda figure, Sigourney Weaver, is perfectly chosen, and Swiss painter-designer H.R. Giger's ominous designs for a derelict spacecraft (rib-like metal bones, portholes which are pendulous ears) and for the Alien itself are magnificent. Not a film for the fearful, delicate or very young.

☆

The remarkable wave of vitality flowing to us from Australia is currently highlighted by two films, an early and a later work by 36-year-old director Peter Weir. **PICNIC AT HANGING ROCK**, which assigns occult reasons to the disappearance of three boarding school members, is perfumed in atmosphere. Its opening scenes of Valentine's Day, 1900, in a Victorian girl's school looks like a David Hamilton fantasy run riot. (Should someone tell these men that no girls, not even high-breasted, nubile nymphets, carry on this way except in the fevered male fantasy?) Weir's imagery is ravishing and serves to cloud the fact that the film's core is thin. But it bears the stamp of a director with a strong personal style and the performances by Dominic Guard and Rachel Roberts are excellent.

☆

Weir's later film, **THE LAST WAVE**, presents a sophisticated lawyer (Richard Chamberlain) in Sydney, whose attempt to put rational explanations to freakish natural phenomenon contrasts with the straightforward way these occurrences are viewed by the Aboriginals. An arresting occult thriller, it explores the world of the Aboriginal past, their "dreamtime," and the question of modern man detached from his collective unconscious. Its stunning images and eerie sound track, roars and whines of dream spirits, animal grunts and growls, are only a small part of its haunting appeal. With **Walkabout**'s extraordinary actor-dancer Gulpilil.



ALIEN

MANHATTAN

THE LAST WAVE

It seems highly unlikely that **A PERFECT COUPLE**'s stars, Marta Heflin and Paul Dooley are actually intended as the title pair. He is a bigoted, immutable son of a loathsome Greek family, apparently drawn by Charles Addams; she is a nerve-strained anorexic rock singer, seemingly as much fun to snuggle down with as a racing bicycle. Nevertheless, the film has a pleasant aftertaste and moments of comfortable charm, particularly when it's glancing around at the lives of the slick, likeable rock group, Keepin' 'Em Off the Streets. And the title couple just may be the two young girl singers of the band: they're compatible, compassionate, have everything in common and are even soon to be parents. Robert Altman seems to be commenting satirically on the hell that can be raised when a couple begins to carry the outside world's projections of romance.

☆

Daryl Duke, the Director of **Payday**, has a sleek new film, **The SILENT PARTNER**, a psychological thriller which centers around a bank robbery while it looks unblinkingly at those who live at the outside limits of sexual danger. Winner of six Canadian awards, including best feature film, it has a perfect performance by Elliott Gould as well as a marvelously restrained characterization by Christopher Plummer as a sexual psychopath, the most alarming since Mark Rydell swung that coke bottle in **The Long Goodbye.** Celine Lomez, new to us, is an effortlessly sexy young woman, somewhere in looks between Florinda Balkan and **Dona Flor**'s Sonia Braga, with charm that is all her own.

★

A PERFECT COUPLE

THE SILENT PARTNER

The Best Thing on TV: Commercials

If you watch television you'll love this book. It's about something you know all too well — the ads — and that no other book or critic (besides McLuhan) has given proper attention to. Considering the amount of sheer cultural effort and cost that focusses into those few-second spots, with the encouragement of this book you can look through them like portholes upon a universe of media empire and nuance. Behind the great ads are great stories.

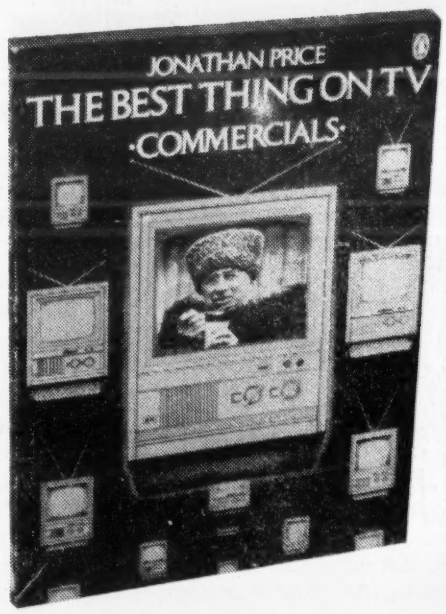
—SB

Twenty-three percent of those commercials rated as the 100 Best in **Advertising Age**'s annual competition come with big stars, most of whom haul down huge salaries — Sir Laurence Olivier, $500,000 from Polaroid; Henry Fonda, $275,000 a year from GAF; Kirk Douglas, $150,000 a year from Bulova.

Clearly, animals would be cheaper. Cats and dogs come at $25 an hour, but if you're pushing pet food, you have to persuade them to eat *your* brand. (To give them anything else is considered deceptive advertising.) Other animals are more expensive: lions cost $150 an hour, and elephants $600 plus trucking. But even if one of these animals eats your extras, or stomps your set, you don't have to pay residuals. So there are scores of commercials that make animals their stars.

•

The door opens, and out gets the man. 'Yea, you're here!' we yell. 'Oh God, God, oh God,' he says and falls down. And we rush out to meet him to find out what's wrong. We got within twenty feet, and then we all started saying 'Oh God.' The bear had been carsick for one hundred and forty miles. He had vomited and defecated all over the inside of the van, all over both the driver and the assistant, and they just had to hang in there and drive. We got the doors open, and the bear is lying there with his feet up in the air. Ohhhhh. It knocked a day out of our shooting, the bear lying there moaning.



The Best Thing on TV: Commercials
Jonathan Price
1978; 184 pp.
$8.95 postpaid
from:
Penguin Books
299 Murray Hill Pkwy.
East Rutherford, NJ
07073
or Whole Earth

The transparent movie star

This story is true.

Back a few years ago, I heard that the Coca-Cola Company once used subliminal advertising between the frames of movie film. This made me quite paranoid about movies, television, and even radio. Then one night, a funny thing happened.

Seeking free entertainment, I had carefully sneaked in a back door of a small movie theater, and was taken by surprise when I entered directly in front of the entire audience. My surprise grew ten fold when I saw that even those in the front row, little more than ten feet away, had not noticed my entrance! I couldn't believe my eyes, so I stuck out my tongue to make sure. No response! I immediately lost interest in the movie, being completely fascinated by the dreamlike appearance of the audience.

I felt like an invisible man, and in the excitement of this ghostly fascination, decided to experiment. There was a small stage directly beneath the screen, and with my heart pounding, I inched on to it — all the while my eyes watching the audience for the slightest response. The movie played directly above my head. I stuck my hand into the image. No one noticed. I was, of course, brightly illuminated in the silver glow. All the eyes seemed to stare directly into mine. At one point, I even snapped my fingers and watched a girl in the front row blink repeatedly in response, unaware of my presence before her.

I settled down to watch the crowd. The movie seemed to evoke quite a range of emotions — now happiness, now suspense, now nervous laughter, etc. — with everyone reacting as one, in unison, always silent or hushed. It was quite strange to watch.

When the house lights went on, only a few people noticed me sitting there on the stage. Of these, some laughed, surprised, then, seeming just a bit embarrassed, left. I laughed a bit myself and went home.

What this has to do with Coca-Cola's advertising, I'm not sure. I don't drink the stuff myself.

Thos. Tietge
Vashon, Washington

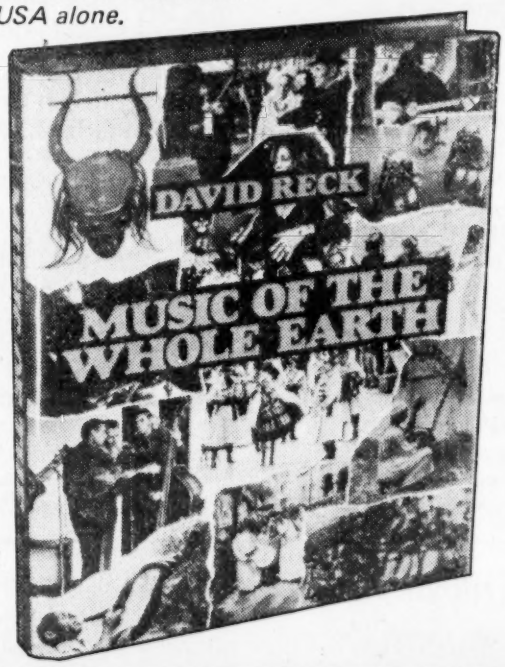
Music of the Whole Earth

This is the most beautiful and essential book on music I have ever seen! Perfectly accessible to the music-lover as well as the music-maker, this is a book that everyone seriously interested in music should read. David and Carol Reck have done a stunning job of tackling an ambitious subject: the charting of "an exquisitely beautiful and relatively unexplored country: the musical landscape of the whole earth."

And this book comes at a most urgent time: traditional musics of the world rank high on the list of endangered species. They too, once gone, will never reappear.

It is time for the musical public to WAKE UP! The same drivel many intelligent people reject in their TV sets, they still put on their record players. Next to the variety and musical richness of these real musics of the world's peoples, the commercial music (pop, folk and much jazz) pumped out for mass consumption today (and blasted on the radio) sounds phony and musically impoverished. And our classical music? Well, just one of many: check out first the classical musics of India, Cambodia, China, Japan, Java, Saudi Arabia, Korea (to name a random few), and THEN let's talk about classical music.

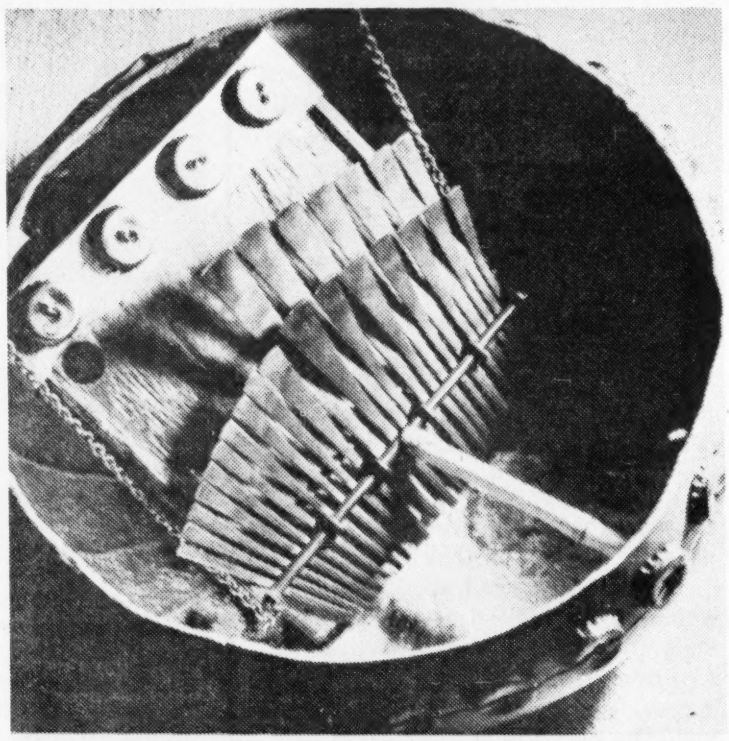
This book covers it all (or, as Reck confesses, as much as humanly possible): from African drumming to Baptist choirs, Bob Wills to Javanese court music; from mariachi bands to the Duke Ellington orchestra to Haydn. . . . and for a start, just check out the varieties of traditional musics here in the USA alone.



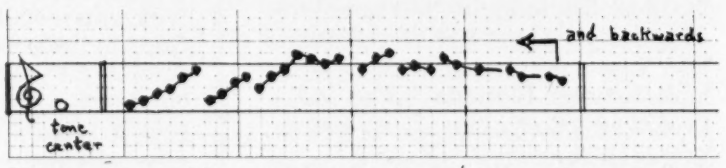
Music of the Whole Earth
David Reck
1977; 545 pp.
$9.95 postpaid
from:
Charles Scribner's Sons
Vreeland Ave.
Totowa, NJ 07512
or Whole Earth

Ideally, reading of this book should be supplemented by listening to records of the musics discussed (all easily available). Never before have we had such access to the musical cultures of the world. It is a Pandora's box of musical enchantment: once you open that box, music, and very likely you yourself, will never be the same again. In that sense therefore, this book is an invitation to be seduced.

—Peter Garland



Mbira dzavadzimu *propped inside its gourd resonator. The bottle caps add a soft buzzing to the gentle sound of the metal keys, which are plucked with thumbs and forefingers. Made by blacksmith John Kunaka Maridzambira. Shona people, Rhodesia.*



Viloma krama *(the same as* cancrizans*/retrograde): a melody going along one way and then reversing itself.*

World Around Songs

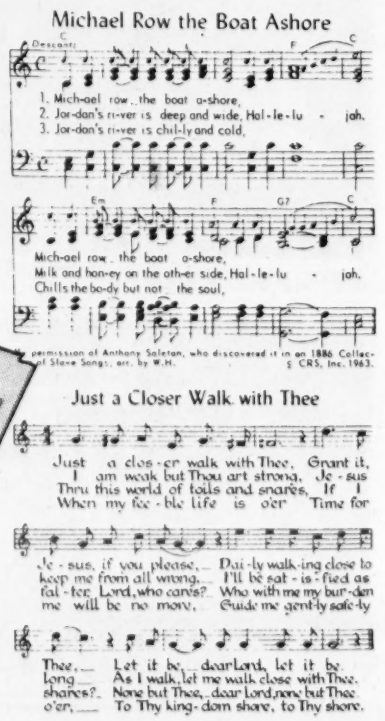
World Around Songs, of Celo, North Carolina, offers a service that might be very useful to any group that was getting together, being neighborly and in the process, singing a few songs. . They publish pocket-size custom song books — 72 in all, sturdy, handsome, useful. World Around Songs is the new name for the old Cooperative Recreation Service, Inc., of Delaware, Ohio. They have a library of some 2000 songs, including many timeless favorites as well as an excellent body of songs from many foreign countries (usually collected and transcribed from native singers).

—Chris Joyner

Sierra Club Songbook, 96 pages, $2.
101 Rounds for Singing, 48 pages, $ .60.
Songs of All Time, 72 pages, $ .80.
73 Sacred Songs, 50 pages, $ .60.
Sing Together Children, 80 pages, $ .90.
African Songs, $ .50.
All 72 books, $22.

World Around Songs
Rt. 5
Burnsville, NC 28714

Sierra Club Songbook



Minox 35 GL

I've had three Leicas, two Nikkormats, a Hasselblad and a 4 x 5 Speedgraphic. These days, except for professional use (with a Leica), the new Minox 35 GL is my camera of choice — winning on pure convenience. Count the therbligs to use it: 1) Snatch from pocket, 2) Open the lens, 3) Eyeball the focus and aperture, 4) Shoot, 5) Fold and repocket. No case or lens cover, shutterspeed set automatically, a very handy automatic flash (no bulbs) if you want it.

Minox — of spy-camera fame — designing a good 35 mm camera makes the same sense as motorcycle manufacturer Honda building a good car. The camera is practically painted around the 35mm film cassette. Its lens is relatively wide-angle (35), simplifying focus, and the shutter is effectively silent: It's a nice people camera. The 35mm format yields good prints and slides, unlike the smaller stuff such as the new Pentax 110.

I haven't photographed for fun in many years. This camera is always on me, like a Swiss army officer's knife, and I'm always reaching for it.

—SB

Minox 35 GL Camera
$240 or so

Minox FL 35
Electronic Flash
$65 or so
from many camera stores

Note: Many stores still carry the older model, the 35 EL, which is less wonderful. Among other things it doesn't have the 2-stop lightmeter override for shooting into the light.

The Friends of Photography

In the world of photography, bargains and excellence are usually mutually exclusive concepts. However there does remain one great bargain of the highest quality, a membership in the Friends of Photography.

For an eighteen dollar fee, less than most photographic books today or a little more than half the price for one hundred sheets of printing paper, one gets twelve monthly issues of the Friends Newsletter, *four issues of the journal* Untitled, *discounts on photographic books, a chance to participate in the annual members-only juried exhibition, and for a very reasonable fee a weekend workshop for Friends of Photography members. In the past year I've also received catalogs for two of the exhibitions presented at the Friends Gallery in the Sunset Center in Carmel, California.*

The journal, Untitled, *is one of the liveliest and best presented publications in photography today. The format varies from collections of essays to the presentation of work by a single photographer. The quality of the reproduction of photographs is excellent, and the writing is always penetrating and provocative.* Untitled *itself more than justifies the membership fee.*

All of this emphasis on quality comes as no surprise since the Friends was founded in 1967 by people like Ansel Adams, Wynn Bullock, Beaumont and Nancy Newhall, and Brett and Cole Weston. The marvel is that access to all this quality work in photography comes at such a reasonable price. Don't be fooled into thinking that only classic west coast photography is allowed. The Friends have encouraged contemporary innovations with exhibitions of the work of Robert Rauschenberg and Robert Heinecken as well as by sponsoring a traveling exhibition on 3M Color-in-Color process.

For those with a bit more money and a desire to collect original photographic prints at very reasonable prices the Friends has a $150 membership which includes all of the above plus one of four original prints. This year the selection includes prints by Brett Weston and an estate print by Doris Ulmann. In the past prints by Ansel Adams, Duane Michaels, Jerry Uelsmann, Minor White, and many others have been offered. This is the ultimate bargain.

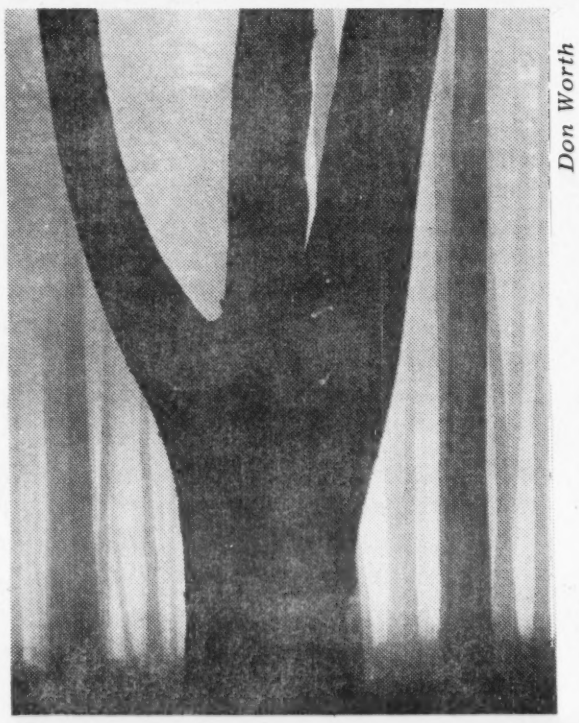
—Andrew Williams

For membership information write:

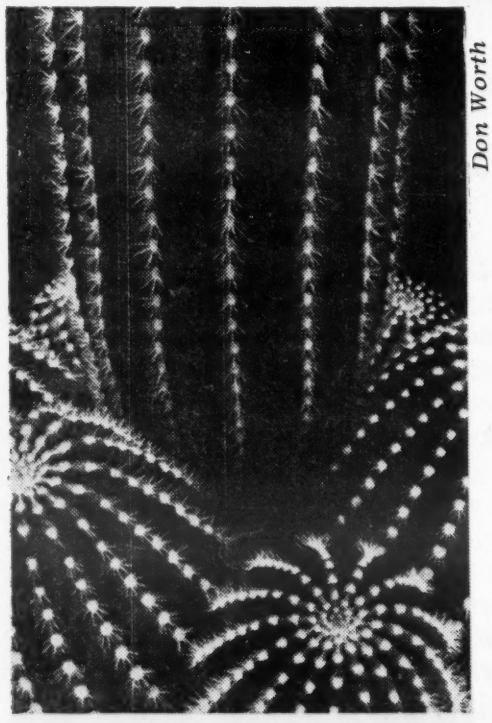
The Friends of Photography
P.O. Box 239
Carmel, CA 93921

"The east coast artist is happy because he is unhappy. The west coast artist is unhappy because he is happy."

— Attributed to D.T. Suzuki



Don Worth



Don Worth

DUNGEONS & DRAGONS®

A vast fantasy universe into which a generation is disappearing.

BY AARON BALDWIN

Introduction by J. Baldwin

When my son Aaron, 15, began to neglect most of his homework and talk gravely of his activities in "D & D" as if they were important, I decided to take a look. He and his friends were certainly not louting around doing nothing, they were completely serious and spending as much time as they could at the game. It turns out that they are not alone. A vigorous subculture phenomenon based on D & D and other fantasy war games is spreading across the USA and the world. The thousands of players are served by a host of books, a growing number of specialty magazines, and retail outlets purveying the necessary trappings for interesting play. Though it is possible to play a shallow game by hard and fast rules as in chess, the fascination is in top-level games that exercise the imagination and require accumulated expertise. Aaron, who is considered to be a top-level player, asserts that most grownups would quickly meet their match. It is far beyond being kid stuff. If you think it is, I invite you to give it a try.

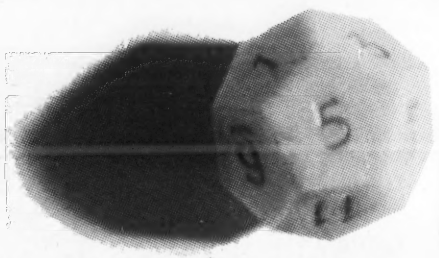
What makes D & D a challenge is that the rules are incredibly complicated, and they are constantly evolving. Then too, there is "game time" and "real time"; for instance, if two characters marry, they have to wait a realtime month before the baby can be played. There are escalations in weapon and counterweapon, changes in the powers of characters and a constant development of traps and tricks. If a player doesn't participate for a month, he may be severely obsolete! Characters accumulate "experience" from game to game as they gather or lose points. The shifts in power are recorded in a book that players keep and carry to the game no matter where the location. The magazines keep everyone informed as to latest developments.

The complexity and time demands of D & D effectively make the players into an elite that is open to the uninvolved only to the extent they are willing to participate in depth. Many are not willing, though there is a growing adult contingent. (Not many women though . . . the game tends to the macho). Staid adults are excluded even more thoroughly from the D & D culture than they were from hard rock in a previous generation; you can't just listen in or play a tape while the kid is away. An extensive jargon also adds to the exclusive aspect of D & D.

I'm not a psychologist, but I think it may be significant that the players are so deeply into the realization of a fantasy world consisting mainly of contest, violence and aggression, and that they do this with a spirit noticeably missing from most of their other duties in the real world. I'm not sure if it's good or bad or if it matters. (Aaron says it's no worse than chess or Go.) Certainly putting a lot of effort into something that encourages imaginative thought can't be all bad, and frankly I think the players may be learning more from D & D than from much of what passes as education these days. I can tell you that if I were 15, I'd be into it up to my ears!

In the article below, Aaron gives you some idea of what it's all about, but he doesn't show you the bright-eyed excitement and challenge of actual play. That's something you'll have to find out for yourself.

–J. Baldwin



DUNGEONS AND DRAGONS is a fantasy role-playing game. Instead of a chip or token to represent him, the player has a Character, an entity created by the roll of dice and the imagination of the player.

"Dungeons and Dragons" is somewhat like The Bead Game in Hesse's **Magister Ludi**. It involves almost every aspect of the mind. Mathematical skills are needed to some extent, strategic skills are needed, and, above all, imagination is needed. It has by far the most complicated set of rules of any modern game. There are at least a hundred rule books and supplements for Dungeons and Dragons, and yet it is a very flexible game. The rules are only guidelines for the players, rather than limitations. The books also have pre-fabricated charts and matrices which are needed for play. A hand-held calculator can be useful.

The game has a definite beginning, but no definite ending. You can win in the short run by succeeding at a mission or rising to great power, but there is always something else to do. You can fail in your mission or be brought down from power, or even be killed. In many cases it is possible to somehow bring life back to a dead character by means of very great magic, but not always. Games have been known to go on for twenty hours at a time, or they can be stopped and picked up later where the adventure was left off.

To begin, a player needs a character, anything from a human to a centaur. Each character has attributes represented on number scales. The primary attributes are strength, intelligence, constitution, wisdom, dexterity and charisma. The extent to which the character possesses these, and other sub-traits, is determined by rolling dice – the higher the number the greater the strength, etc. As the character is played, or "run," it gains experience and becomes more complex and able. Rolling the dice is the mechanical and complicated part of Dungeons and Dragons and is best explained by playing.

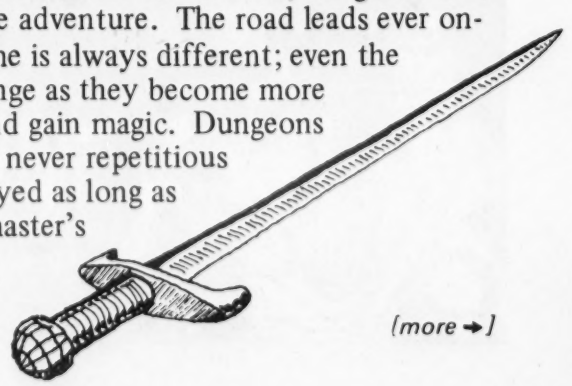
After rolling the dice and consulting rule book charts, you have a character. The next step is to decide what the character's profession, or "class" will be. The four major classes are fighters, wizards, thieves and clerics. Within each class there are many sub-classes. A player might choose the role of ranger for his character, like Aragorn in **The Lord of the Rings**. He might dip into the powerful but hazardous world of wizardry, or choose to be a thief, stealing what he cannot gain with raw strength.

The character must then be equipped with the proper accoutrements. If he becomes a fighter he will need armor and sword; if a thief he will need ropes and daggers and all the stuff of thievery. After the equipment is dealt with, the characters of all the players are ready for the first adventure.

To play Dungeons and Dragons you need paper, a pencil, a lot of dice, imagination, and at least one person who knows how to play. There is no board, per se, but some players use plot boards, which are just giant graphs, about one square per inch, and small lead figures of characters. The figures are available at most Dungeons and Dragons outlets. This serves to lend a certain tangibility to the game and enhances the strategic possibilities.

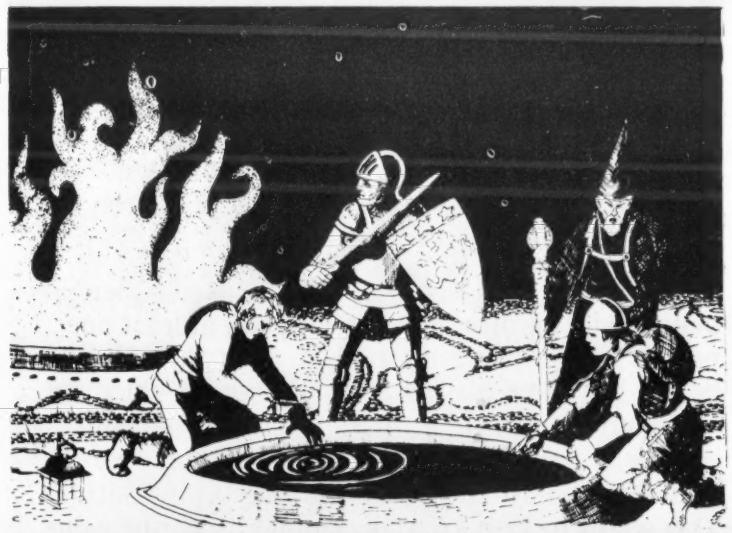
Each game has any number of players and one referee or "dungeon master," who knows how to play. The other players use their characters to adventure in the dungeon master's world. His world has cities, forests, swamps, castles and anything else he wants because he creates the world. This can include non-player characters. One such might be Mr. Felians-sphopo, whose skills include sucking organs out of opponents with his toes. The dungeon master uses the rule book, or should, only for a few monsters or treasures; the rest he invents himself. He and the players do use the books' various battle systems and other fixed rules, which indicate how quickly and effectively characters can act. However, there are at least fifty battle systems; thus the dungeon master must choose a system for his world to function in, either straight from the books or modified to fit his own ideas of what a system should be like.

Once the game begins, what do the characters do? In most cases they either wander around looking for adventure or they are sent on some sort of mission by someone (an invention of the dungeon master) who needs help. Perhaps a powerful warlock wishes to claim some territory as his own. However, there are three great beasts that hinder him. Being preoccupied with affairs concerning his invasion, he can't go into combat himself, so he hires adventurers to do it for him. These are the players' characters. They of course will want to know what the reward is. Once the negotiations are settled the characters set out. Getting to the lair of the beasts could be an adventure in itself. They may meet an elf king, or demons, or find a chance to get some extra loot. When they at last engage the monsters, hopefully slay them, and return for the reward, the game is not over – only the adventure. The road leads ever onward. The game is always different; even the characters change as they become more experienced and gain magic. Dungeons and Dragons is never repetitious and can be played as long as the dungeon master's wits hold out and his dice still roll.



[more →]

Pool of wine – This pool is filled with powerful wine of a deep red color. Not only is it excellent wine, it has a taste so inviting that anyone tasting it will be prone to drink more and more until intoxicated! If a sip is taken, the taster will have a 60% chance of drinking more (regardless of the player's wishes). If this is done, three 6-sided dice are thrown and compared to the character's constitution rating; if the number rolled is greater than the character's constitution score, then the difference is figured, and this is the number of hours the character will be intoxicated (if the roll is equal or or less, the character "holds his liquor" and is unaffected). Any character so intoxicated will suffer the following penalties: –2 on all rolls "to hit" in combat, –3 to dexterity rating, and any other disadvantages to being drunk that the DM may deem in effect (prone to loud and boisterous speech, stumbling about, a greater chance to be surprised, etc.). After the allotted number of hours have passed, the character returns to normal. Any intoxicated character who returns to the pool of wine will have a 90% chance of drinking too much again, and the check against constitution will then be necessitated once more. If any of the wine is removed from the room, it will immediately lose its potency and be considered as normal wine, but actually rather weak in its effects.



—*Introductory Dungeons & Dragons*

The following is a list of companies and the role-playing games that are available from them. Conventional abbreviations are in parenthesis.

Archive Miniatures
111 S. Railroad Ave.
San Mateo, CA 94402

Star Rovers (in preparation)

Fantasy Games Unlimited, Inc. (FGU)
P.O. Box 182
Roslyn, NY 11576

Chivalry and Sorcery (C&S)
Bunnies and Burrows
Flash Gordon & the Warriors of Mongo
Starships and Spacemen

Gamescience
Lou Zocchi & Associates
7604 Newton Dr.
Biloxi, MS 39532

Knights of the Round Table
Space Patrol
Superhero 2044

TSR Hobbies, Inc. (TSR)
P.O. Box 756
Lk Geneva, WI 53147

Dungeons and Dragons (D&D)
Gamma World
Empire of the Petal Throne (EPT)
Metamorphosis Alpha (MA)
Star Probe
Star Empires

Tyr Gamemakers Ltd.
P.O. Box 414
Arlington, VA 22210

Space Quest
Bushido

Metagaming
P.O. Box 15346
Austin, TX 78761

Monsters! Monsters! (M!M!)

The CHAOSium
P.O. Box 6302
Albany, CA 94706

RuneQuest (RQ)

Flying Buffalo, Inc.
P.O. Box 1467
Scottsdale, AZ 85252

Tunnels and Trolls (T&T)
Starfaring

Game Designers Workshop (GDW)
203 North St.
Normal, IL 61761

En Garde!
Traveller

Legacy Press
217 Harmon Rd.
Camden, MI 49232

Legacy

James E. Mathis
2428 Ellsworth (No. 102)
Berkeley, CA 94704

Arduin Grimoire
Welcome to Skull Tower
Runes of Death

Heritage Models, Inc.
9840 Monroe Dr. (Bldg. 106)
Dallas, TX 75220

Star Trek

The following is a list of magazines that may be of interest to role-playing gamers. Their usual abbreviations are in parenthesis.

ALARUMS AND EXCURSIONS (A&E)
Lee Gold
3965 Alla Rd.
Los Angeles, CA 90066

THE DRAGON (TD)
TSR Periodicals, Inc.
P.O. Box 110
Lk Geneva, WI 53147

THE WHITE DWARF (WD)
Games Workshop
One Dalling Rd.
Hammersmith, London
W6 OJD
England

THE WILD HUNT (TWH)
Mark Swanson
71 Beacon St.
Arlington, MA 02174

THE SPACE GAMER (TSG)
Metagaming P.O. Box 15346
Austin, TX 78761

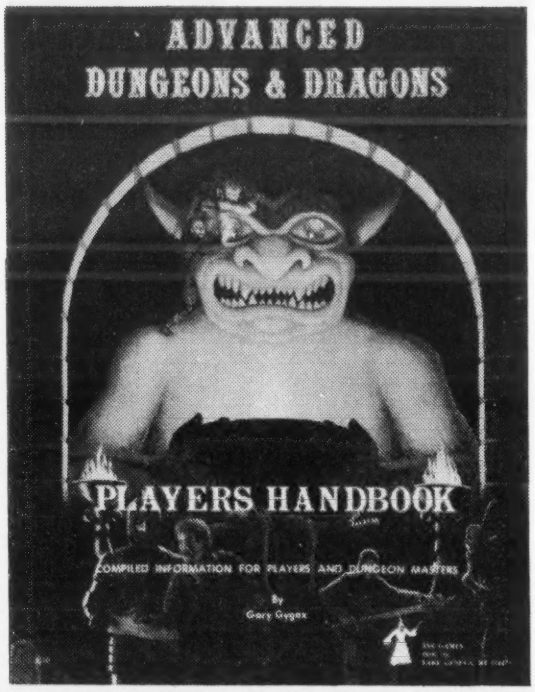
SORCERER'S APPRENTICE
Flying Buffalo, Inc.
P.O. Box 1467
Scottsdale, AZ 85252

THE JUDGES GUILD JOURNAL (JGJ) and THE DUNGEONEER
Judges Guild
1165 N. Univ.
Decatur, IL 62526

THE LORDS OF CHAOS (LOC)
Nicolai Shapero
8885 Earhart Ave.
Westchester, CA 90045

WARGAMING
Fantasy Games Unlimited, Inc.
P.O. Box 182
Roslyn, NY 11576

This list is from **Different Worlds**, *$9/yr (six issues), from Box 6302, Albany, CA 94706.*



Mordenkainen's Faithful Hound
(Conjuration/ Summoning)
Level: 5
Range: 1"
Duration: 2 rounds/level
Area of Effect: Special
Components: V, S, M
Casting Time: 5 segments
Saving Throw: None

Explanation/Description: By means of this spell the magic-user summons up a phantom watchdog which only he or she can see. He or she may then command it to perform as guardian of a passage, room, door, or similar space or portal. The phantom watchdog will immediately commence a loud barking if any creature larger than a cat approaches the place it guards. As the *Faithful Hound* is able to detect invisible, astral, ethereal, out of phase, duo-dimensional, or similarly non-visible creatures, it is an excellent guardian. In addition, if the intruding creature or creatures allow their backs to be exposed to the phantom watchdog, it will deliver a vicious attack as if it were a 10 hit dice monster, striking for 3 - 18 hit points of damage, and being able to hit opponents of all sorts, even those normally subject only to magical weapons of +3 or greater. The *Faithful Hound* cannot be attacked, but it can be dispelled. Note, however, that the spell caster can never be more than 3" distant from the area that the phantom watchdog is guarding, or the magic is automatically dispelled. The material components of this spell are a tiny silver whistle, a piece of bone, and a thread.

•

In addition to the common tongue, all intelligent creatures able to converse in speech use special languages particular to their alignment. These *alignment languages* are: Chaotic Evil, Chaotic Good, Chaotic Neutral, Lawful Evil, Lawful Good. Lawful Neutral, Neutral Evil, Neutral Good, and Neutrality. The alignment of your character will dictate which language he or she speaks, for *only one alignment dialect can be used by a character.*

SPELL TABLES

CLERICS

Number	1st Level	2nd Level	3rd Level
1	Bless	Augury	Animate Dead
2	Command	Chant	Continual Light
3	Create Water	Detect Charm	Create Food & Water
4	Cure Light Wounds	Find Traps	Cure Blindness
5	Detect Evil	Hold Person	Cure Disease
6	Detect Magic	Know Alignment	Dispel Magic
7	Light	Resist Fire	Feign Death
8	Protection From Evil	Silence 15' Radius	Glyph Of Warding
9	Purify Food & Drink	Slow Poison	Locate Object
10	Remove Fear	Snake Charm	Prayer
11	Resist Cold	Speak With Animals	Remove Curse
12	Sanctuary	Spiritual Hammer	Speak With Dead

•

I don't think I have ever seen a product sell so quickly as did the Handbook when it first appeared on the Games Workshop stand at Dragonmeet. As Ian Livingstone remarked (he was standing on one side with a slightly bemused air, watching the crowds press forward in the queue for their copies), it was as though Games Workshop had suddenly invented sliced bread. As I am sure many others did, I burned the midnight oil after Dragonmeet perusing this new acquisition and becoming more and more engrossed.

When I first started reading the Handbook, I jotted down notes of changes which had been made to the original rules, but it wasn't long before I realised that a review which listed all the changes would be nearly as long as the Handbook itself. Suffice it to say that whereas the original rules are ambiguous and muddled, the Handbook is a detailed and coherent game-system, and very sophisticated.

A few examples (there are many) will serve to illustrate: fighters, clerics and thieves have improved hit-dice (D10, D8 and D6 respectively); the effects of strength on hit probability, damage, weight allowed, open doors are changed; high intelligence confers slightly more chance of spell knowledge and language facility; wisdom now gives clerics a spell-bonus while low wisdom gives a chance of spell failure; there are new charts delineating the effects of constitution, dexterity and charisma; there are five main character classes (including the Monk) and five sub-classes (Ranger, Paladin, Druid, Illusionist and Assasin) each with its own 'experience' table; most classes find it slightly harder to gain promotion above third or fourth levels; first level clerics now have one spell; paladins are much more powerful but have to satisfy more rigorous criteria; supplies are much more expensive; there is a non-decimal monetary system in which 1GP is now worth 20SP for example, and huge lists of spells and their descriptions (many new ones in all classes), multi-classed characters, the seven races and their advantages/disadvantages and many other things.

Comment on **Advanced Dungeons & Dragons Players Handbook** *in* **White Dwarf.**

Dropping in to an RPG (role-playing game) store is the easiest way to glimpse the kaleidoscopic surface of the D & D phenomenon. (Check your phone directory under "games.") The store is usually busy with obsessed kids speaking of utterly arcane matters. The clerk may explain that some of the customers get their first jobs to support their Dungeons and Dragons habit. They buy dozens of pamphlets offering new levels of complexity in spells, weaponry, character, plot turns, etc. They buy hundreds of the lead miniature characters and lovingly paint them. They buy and borrow obscure adult texts on medieval warfare, sorcery, etc., and neglect school to study them.

Dungeons and Dragons was born in approximately 1973 in Wisconsin, begun as a commercial product by TSR Games, Box 756, Lake Geneva, WI 53147. TSR's introductory D & D basic set costs $9.95, the **Advanced Dungeons and Dragons Players Handbook** *costs $9.95, and their complete catalog of fantasy, science fiction, and historical games and rules costs $2 – add $1 for handling.*

Naturally there are many others in the commercial end of D & D by now, but, like jogging, the game defies commercialization. The players are making their own world; they don't need to buy someone else's. ■

–SB

MOCK RISK GAMES

BY HENRY FLYNT

Illustrations by Jay Kinney

SUPPOSE YOU STAND in front of a swinging door with a nail sticking out of it pointing at your face; and suppose you are prepared to jump back if the door suddenly opens in your face. You are deliberately taking a risk on the assumption that you can protect yourself. Let us call such a situation a "risk game."

Henry Flynt's essay, "Concept Art," introduced that genre in 1961 and offered some of the earliest and most sophisticated examples of it, but to think of his subsequent work solely in those terms is to miss the true scope of his undertaking. What he's really up to (according to a recent essay called "On Superior Obscurity") is "breaking the bonds of objectivity."

To that end he's adopted a two-part strategy – pursuing a relentlessly skeptical critique of "ordinary experience," "common sense," "inherited reality," etc., and on the positive side creating "new intellectual modalities." His primary tool (aside from a crystal-clear, trenchant mind) is the elaboration of a paradox: it is possible to believe in and experience the logically impossible. "Mock Risk Games" is an early set of exercises based on that paradox. By providing gamers with plans for making the incredible credible, Flynt hoped to get them "TO ARRIVE AT A WORLD OF 'MIRACLES' THROUGH THE DECREASE OF CREDULITY."

"Mock Risk Games" is reprinted from a collection of Henry's writings called **Blueprint for a Higher Civilization,** *edited by Germano Celant and published in Italy by Multhipla Edizioni in 1975. Now 40, he lives in New York and is completing a doctorate in socialist economics.*

–Robert Horvitz

Then a mock risk game is a risk game such that the misfortune which you risk is contrary to the course of nature, a freak misfortune; and thus your preparation to evade it is correspondingly superficial.

If the direction of gravity reverses and you fall on the ceiling, that is a freak misfortune. If you don't want to risk this misfortune, then you will anchor yourself to the floor in some way. But if you stand free so that you can fall, and yet try to prepare so that if you do fall, you will fall in such a way that you won't be hurt, then that is a mock risk game. If technicians could actually effect or simulate gravity reversal in the room, then the risk game would be a real one. But I am not concerned with real risk games. I am interested in dealing with gravity reversal in an everyday environment, where everything tells you it can't possibly happen. Your "preparation" for the fall is thus superficial, because you still have the involuntary conviction that it can't possibly happen.

Mock risk games constitute a new area of human behavior; because they aren't something people have done before, you don't know what they will be like until you try them, and it took a very special effort to devise them. They have a tremendous advantage over other activities of comparable significance, because they can be produced in the privacy of your own room without special equipment. Let us explore this new psychological effect; and let us not ask what use it has until we are more familiar with it.

Instructions for a variety of mock risk games follow. (I have played each game many times in developing it, to ensure that the experience of playing it will be compelling.) For each game, there is a physical action to be performed in a physical setting. Then there is a list of freak misfortunes which you risk by performing the action, and which you must be prepared to evade. The point is not to hallucinate the misfortunes, or even to fear them, but rather to be prepared to evade them. First you work with each misfortune separately. For example, you walk across a room, prepared to react self-protectingly if you are suddenly upside down, resting on the top of your head on the floor. In preparing for this risk, you should clear the path of objects that might hurt you if you fell on them; you should wear clothes suitable for falling; and you should try standing on your head, taking your hands off the floor and falling, to get a feeling for how to fall without getting hurt. After you have mastered the preparation for each misfortune separately, you perform the action prepared to evade the first misfortune and the second (but not both at once). You must prepare to determine instantly which of the two misfortunes befalls you, and to react appropriately. After you have mastered pairs of misfortunes, you go on to triples of misfortunes, and so forth.

The principal games are for a large room with no animals or distracting sounds present.

•

A. Walk across the lighted room from one corner to the diagonally opposite one, breathing normally, with your eyes open.

1. You are suddenly upside down, resting on the top of your head on the floor. You must get down without breaking your neck.

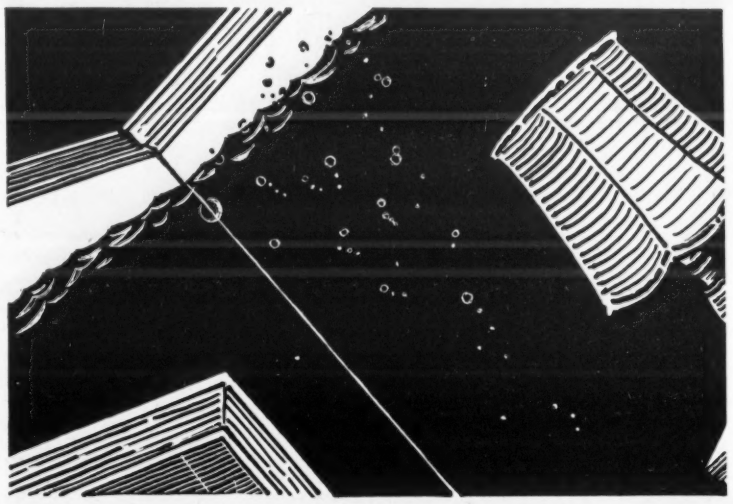
2. Although the floor looks unbroken and solid, beyond a certain point nothing is there. If you step onto that area, you will take a fatal fall. Thus, as you walk, you must not shift your weight to your forward foot until you are sure it will hold. Put the ball of the forward foot down before the heel.

3. Something happens to the cohesive forces in your neck so that if your head tips in any direction, it will come right off your body, killing you immediately. Otherwise everything remains normal. Thus, as you walk, you must "balance" your head on your neck. When you reach the other side of the room, your neck will be restored to normal. (Prepare beforehand by walking with a book balanced on your head.)

4. Invisible conical weights fall around you with their points down, each whistling as it falls. You must evade them by ear in order not to be stabbed. Walk softly and fast.

5. The room is suddenly filled with water. You have to control your lungs and swim to the top. Wear clothes suitable for swimming.

A . Play game 'A' while on a long walk on an uncrowded street. The floor is replaced by the sidewalk. The fifth misfortune is for space suddenly to be filled with water to a height of fifteen feet above the street.



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B. Lie on your back on a pallet in the dimly lit room, hands at your sides, with a pillow on your face so that it is slightly difficult to breathe, for thirty seconds at a time.

1. The pillow suddenly hardens and becomes hundreds of pounds heavier. It remains suspended on your face for a split second and then "falls," bears down with full weight. You must jerk your head out from under it in that split second.

2. The pillow adheres to your skin with a force greater than your skin's cohesion, and begins to rise. You must rise with it in such a way that your skin is not torn.

•

C. Lie on your back on the pallet in the dimly lit room.

1. Gravity suddenly disappears completely, so that nothing is held down by it; and the ceiling becomes red-hot. You must avoid drifting up against the ceiling.

2. The surface you are lying on becomes a vast lighted open plane. From the distance, giant steel spheres come rolling in your direction. You must evade them.

3. Your body is split in half just above the waist by an indefinitely long, rather high, foot-thick wall. Your legs and lower torso are on one side, and your upper torso, arms, and head are on the other side. Matter normally exchanged between the two halves of your body continues to be exchanged through the wall by telekinesis. It is as if you are a foot longer above the waist. In order to reunite your body, you must first roll over and get up, bent way forward. There are depressions in the wall on the same side as your feet. You have to climb the wall, putting your feet in the depressions and balancing yourself. You will be reunited when you reach the top and your waist passes above the wall.

•

D. Sit in a plain, small, straight chair, on the edge of the seat, hands hanging at the sides of the seat, feet together in front of the chair, in the lighted room, for about thirty seconds at a time.

1. The chair is suddenly out from under you and sitting on you with its legs straddling your lap and legs. You have to get your weight over your feet so you won't take a hard fall. *[more →]*

MOCK RISK GAMES

BY HENRY FLYNT

Illustrations by Jay Kinney

SUPPOSE YOU STAND in front of a swinging door with a nail sticking out of it pointing at your face; and suppose you are prepared to jump back if the door suddenly opens in your face. You are deliberately taking a risk on the assumption that you can protect yourself. Let us call such a situation a "risk game."

Henry Flynt's essay, "Concept Art," introduced that genre in 1961 and offered some of the earliest and most sophisticated examples of it, but to think of his subsequent work solely in those terms is to miss the true scope of his undertaking. What he's really up to (according to a recent essay called "On Superior Obscurity") is "breaking the bonds of objectivity."

To that end he's adopted a two-part strategy – pursuing a relentlessly skeptical critique of "ordinary experience," "common sense," "inherited reality," etc., and on the positive side creating "new intellectual modalities." His primary tool (aside from a crystal-clear, trenchant mind) is the elaboration of a paradox: it is possible to believe in and experience the logically impossible. "Mock Risk Games" is an early set of exercises based on that paradox. By providing gamers with plans for making the incredible credible, Flynt hoped to get them "TO ARRIVE AT A WORLD OF 'MIRACLES' THROUGH THE DECREASE OF CREDULITY."

"Mock Risk Games" is reprinted from a collection of Henry's writings called **Blueprint for a Higher Civilization,** *edited by Germano Celant and published in Italy by Multhipla Edizioni in 1975. Now 40, he lives in New York and is completing a doctorate in socialist economics.*

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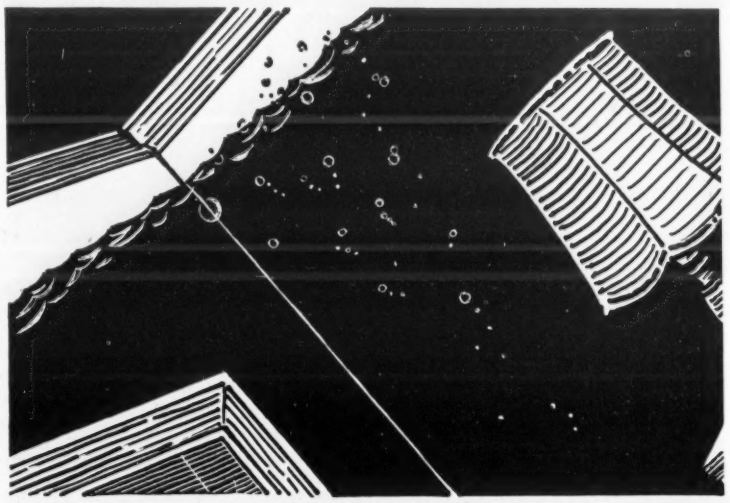

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•

D. Sit in a plain, small, straight chair, on the edge of the seat, hands hanging at the sides of the seat, feet together in front of the chair, in the lighted room, for about thirty seconds at a time.

1. The chair is suddenly out from under you and sitting on you with its legs straddling your lap and legs. You have to get your weight over your feet so you won't take a hard fall. *[more →]*

2. The direction of gravity reverses and the chair remains anchored to the floor. You have to grab the seat and hold on in order not to fall on the ceiling.

3. You are suddenly in a contra-terrene universe, in which the atmosphere is unbreathable and prolonged contact with either the atmosphere or the ground will disintegrate you. The seat and back of the chair become a penetrable hyperspatial sheet between the alien universe and your own. As soon as you feel the alien atmosphere, you must jerk your feet off the ground and deliberately sink or plunge through the seat and back of the chair in the best way that you can. You will end up on the floor under the chair in your universe.

4. You are suddenly in dark empty space in a three-dimensional lattice of gleaming wires. Segments of the lattice alternately burst into flame and cool off. You adhere to the chair as if it were part of you. With your hands holding onto the seat, you can move yourself and the chair forward by pushing the seat forward with your hands; you can move backward by pulling backward; you can move up by pulling up on the seat; and so on. The lattice is formed in such a way that in order to move from one cell to the next, you always have to turn to some extent. Flames immediately spring up next to you, and you have to maneuver yourself through the lattice to escape them.

D. Play Game 'D' in situations where you have to sit and wait.

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Note: The original version of "Mock Risk Games" was entitled "Exercise Awareness-States." It was written during April-July, 1961; and read at the AG Gallery in New York on July 15, 1961. I subsequently turned against amusemental compositions, and around June 25, 1962 I sent the only copy of "Exercise Awareness-States" to the young musician Tom Constanten, at 1650 Michael Way in Las Vegas. I later wrote Constanten asking him to return the MS, but I never heard from him. The present revival analyses the activity better than the original version did. I am unable, though, to remember some of the most elegant misfortunes for the original games (A, B, C); and it seems that they are permanently lost.

In developing the original games — and the present games — I had two objectives in mind. First, the experience of playing the games (as opposed to reading or analyzing them) must involve or compel you, must be vivid and immediate. Secondly, the misfortunes must be elegant, undreamed-of "explosions" of the natural order. These objectives, though, do not constitute a use for the games. The games can have many uses, beginning with amusement; and it remains to be seen what the most significant use will be.

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Intrusions

A noise in an adjacent room may intrude on a person playing a mock risk game, and affect his experience or state of being in a variety of ways. Let us consider the effects of such "intrusions" on the player's state. There are several kinds of intrusions. "Distractions" are perceived by the player to be unrelated to the game, and tend simply to take his mind off it. "Bogies" are surprises which so fit in with the game that the player momentarily thinks a freak misfortune has really begun; they tend to frighten the player and halt the game. "Modulations" are changes in the player's state or mood which may enhance the game; they are typically induced with drugs.

The player himself can turn the radio on, bring in a cat, or otherwise create distractions for himself. Here the object of study is how compelling the game is. Through how much distraction can the game hold the player's attention? Turning to modulations, the player can also produce them for himself.

More elaborate investigations require an experimenter outside a room where the subject is playing mock risk games. The experimenter needs a one-way window and an intercom to observe and talk with the subject. Here the effects of bogies can be studied. (The experimenter has a problem though, in that after he frightens the subject, the subject will forget about the game and just watch out for the bogies.) Here are some sample bogies, for game 'A'. 1. Trip the subject with an invisible thread. 2. Cause the floor to shift. 3. Throw a ping pong ball at the subject from the side. 4. Squirt water on him from behind. The mechanics of the experiments can readily be worked out by anyone interested in them. After an intrusion, the experimenter should question the subject about his reaction if it is appropriate.

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Mock Risk Games for Couples (Duo Games)

In order for these games to be successful, each of you has to have confidence that the other is actually playing. If you lack this confidence, you forget the game and just watch out for intrusions created by the other.

AA. Face each other at a distance and walk toward each other.

1. The other's head flies off and hurtles at you like a cannonball. It can swerve up or down, so that you will be hit unless you jump aside. The time you have to jump is about the same no matter what your distance from the other is, because the head accelerates rapidly.

2. Just as the other is putting his foot down to make a step, he suddenly becomes so large that his foot is descending right over your head. At the same time, the mental commands of each of you to your muscles begin to be transmitted to the other's muscles rather than your own, and to be executed by his muscles rather than by yours. Thus, you must jerk "your"/"his" foot back, rather than complete the step, in order not to "step on your own head." The two of you should walk in step, right foot with right and left with left. Watch the other's feet and also watch above yourself – using your vertical peripheral vision to do so. In short, if you suddenly see a giant foot coming down on you, jerk "your" forward foot back.

3. (This misfortune is exceptionally complex, but there are good reasons for the complexity, and it will repay study.) The consciousness of each of you suddenly becomes located in the other's body and becomes hooked into the other's receptors and muscles. At the same time, your body, which is now "outside you" and which is under the other's control, becomes surrounded by slowly moving beams of tissue-destroying radiation coming from the sides of the room. The radiation is invisible, but the eyes you are seeing through become sensitive to it. At the same time, the other mind loses its knowledge of language. In order to save your body, under the other's blind control, from blundering into a radiation beam, you have to communicate pre-verbally to the other mind by every means from vocal cries to pantomime, and get your-body/his-mind out of range of the radiation. When the body is out, you will both be restored to normal. (The first thing to anticipate is the basic shift in viewpoint by which you will be looking at your own body from the other's position. There is no point in tensing your muscles in preparation for the misfortune, because if it occurs, you will be working with a strange set of muscles anyway. The next thing to prepare to do is to spot the radiation beams; and then to yell, gesture, or whatever – anything to get the "other" to avoid the radiation. Note finally that neither player prepares for the possibility that he will be surrounded by radiation. Each player prepares for the same role in an asymmetrical pas de deux.)

Asymmetry: The two of you play a given duo game, but each prepares to evade a different misfortune.

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AB. Stay awake with eyes closed for an agreed-upon time between one and fifteen minutes. Use a timer with an alarm.

1. Each suddenly has the other's entire present consciousness in addition to his own, from perceptions to memories, ideologies, ambitions, and everything else – threatening both with psychological shock.

The couple must take up positions such that their sensory perceptions are as nearly identical as possible. Beforehand, each must discuss with the other the aspects of the other's attitude to the world which each most fears having imposed on his consciousness. During the game, each must think about these aspects and try to prepare for them.

2. Each suddenly relives the other's most intense past feelings of depression and suicidal impulses. In other words, if five years ago the other attempted suicide because he failed out of college, you suddenly have the consciousness that "you" have just failed out of college, are totally worthless, and should destroy yourself. Presumably the other has since learned to live with his past disasters, but you do not have the defenses he has built up. You are overwhelmed with a despair which the other felt in the past, and which is incongruous with the rest of your consciousness. In summary, both of you risk shock and suicidal impulses. Beforehand, of course, each must tell the other of his worst past suicidal or depressed episode; and discuss anything else that may minimize the risk of shock.

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Intrusions in Duo Games

As before, distractions and modulations can be openly studied by consent of the players. As for bogies, it is possible in duo games for one player to create a bogy without warning, in effect acting as a saboteur. As soon as a game is sabotaged, though, confidence is lost, and each player just watches out for the other's bogies. Here are some sample intrusions.

GAME	DISTRACTION	BOGY	MODULATION
AA. 1.	cough	shout in other's face	each take a different drug
2.	talk and laugh get out of step	stamp hard get out of step	
3.	spin around	spin around	
AB. 1. & 2.	cough talk and laugh	gasp silently pass palm back & forth in front of other's face	

■

LATIME

Consolation

by REBECCA LATIMER

I am lying on my side while the pictures are being taken; the doctor is looking for signs of arthritis. Then he comes back to say I may get dressed. Left alone, I sit up on the X-ray table, reaching for my clothes.

Across from me is a lighted panel with three X-rays hung on it. Usually the collection is of cloudy lungs or broken bones, but today it is a backbone and two profiles of a neck and skull. The neck and skull are amazing. I admire them as I button my blouse.

The bony structure of the skull, smooth and patterned, reminds me of the plated, geometric back of a turtle. Below it, the notched neck first curves out from the shoulders and then back into the base of the head, as graceful as the stem of a trillium, but seeming far too fragile to support that heavy skull.

In the dark picture, the teeth, startlingly large and white, grin, classically macabre. *Are those fillings?*

The huge eye socket, deep, mysterious, is an ambiguous pool.

(I am so lost in the pictures I almost forget to dress.)

The slight forward slope of the shoulders and head is that of any old woman, humble, apologetic, an attitude forced on us by the (here invisible) Dowager's Hump at the back of our necks. No matter how proud we are – *I struggle to hold my head up!* – our very structure makes us bow our heads.

Oh yes, of course! The X-ray is of my own neck and head. I've finally noticed the REBECCA LATIMER in the upper corner.

The doctor, who had known me for a long time, smiled when I asked for the X-ray of my neck and skull.

"What will you do with it?"

"Hang it in my window against the light."

So it hangs there and I look at it from time to time. Though my seventy-three years have made my face a map of wrinkles, I can now see through them to that neat, smooth skull.

I've always been aware that, beneath the protective shell laid on me by life, there quivers a small girl-child, the very child for whom this skull was molded, years ago. ▪

Box 428, Sausalito, CA 94965

Walter Kilchherr

The author now, 74.

Getting Older

by Rebecca Latimer

1922. Rebecca Heigh [Latimer] at 16, graduating from high school in Cranford, New Jersey – the end of her schooling.

WHEN YOU'VE PASSED SIXTY, if you haven't seen a friend for several years, meeting may produce a shock. Once having lunch with a friend I'd known since childhood, I was rattling on with do-you-remembers-? when she suddenly interrupted me. "Oh, now that you smile I recognize you!"

My cousin, Emily, was much gentler. "I see you've finally grown up! Do you enjoy your white hair? You might try a cane like mine; the combination gets me all sorts of privileges!"

My cousin Emily has taught me a lot about growing older. She's been ahead of me all the way, more than twenty years ahead.

That day at tea she grimaced when she got up from her chair. "It's only my body," she explained. "I'm not really interested in it. It creaks and it cracks, but it's not me, I only live in it."

That was ten years ago and now Emily lives in an old people's home in Florida. She is in her 97th year and there are days she isn't up to writing, but at least once a month I see her strong vigorous writing on an envelope. She writes as clearly as she ever did – thinks just as clearly too.

"Don't let anyone tell you that old people aren't vain. Our beautician is the favorite of our household. But my hair is still straight and plain!" (Drawn back as always, I imagine, into that smooth knot.)

She has a little garden under her window, going out "three-legged" with her cane to tend it. "I'm a comical sight!" Nothing disturbs her calm and nothing seems to anger her.

She tells us that at the old people's home, "when a resident died, all possessions are tossed out in the trash, so I am disposing of my own trashy treasures myself. She asks if we would like a photograph of our great grandmother taken in 1861, holding on her knee Emily's mother, an infant and her namesake. (It must have been made by an excellent photographer; it is a stunning picture.)

Emily never married, but when she heard that one of us had been ill, she wrote, "I feel like the great grandmother of the world these days and would like to save all my children pain."

When I was in my early twenties, hardly touching the ground as I flew around New York – to my job at **The New Yorker**, to dinner at the Russian Bear, to the theatre to see Ethel Barrymore, Emily had a fabric and decorating shop in an old brownstone house off Madison Avenue. I used to dart in to admire the Fortuny prints and batiks, and spend the night if it was too late to take the train home. I used

Rebecca Latimer lives in Sonoma, California and came to CQ *out of the clear blue mailbox on a day the* I Ching *would've predicted "unexpected blessings" if I'd asked. She has lots more good writing like this in her files, which include not only the plays, stories and cookbooks she started writing at age 8 but also things her mother wrote – so her files go back to 1870.*

She tells me that she is now working on a book about "our twenty-five years in the Foreign Service. (How did we stand it? Actually we broke down under it. broke down over and over, but didn't have the sense, the sense or the nerve, to get out.) You may have wondered if Fred had been an Important Official. He got to be a First Secretary – not important. We didn't fit the image of diplomats. We learned the language and got to know the people wherever we were sent. It seems incredible, but this is NOT DONE in the diplomatic service."

She's been published in Harper's *and* The Foreign Service Journal. *She also has a published book –* Susie and Leyla: Teenagers in Turkey *(Bobbs Merrill), and two more books for high school age that have been rejected because of "not enough sex and hard drugs." In the '20s she worked on the editorial side of a muckraking Greenwich Village paper called* Plain Talk *and the advertising side of* The New Yorker.

—Anne Herbert

to admire Emily too, that successful "older woman."

Now, it seems as if the years between us had melted away and we are as close as twin sisters.

Getting Older

When you are in your 74th year, what do you think about? Death, the flight of birds, your granddaughter, the clouds flowing across the mountains . . . HURRY!

But more often than anything, I think about how I have changed. Am I myself at last? Who is myself? And who will I be in my 80th year? And who will I be if I reach my 100th year, as my mother did? (When she was awake, she was tart.) Will every year change me? I can see an immense change between being sixty and being seventy. When I came up to sixty, I was still – what? I must find out!

1929. Fred and Rebecca Latimer in the office of the American Consulate, San Salvador, Central America – their first post in what turned out to be 25 years in the Foreign Service.

And when I look back, I wonder, was twenty-five years abroad useful or devastating? Who was I in my 23rd year, going to live in El Salvador? Who was I when I left Salvador after two years of malaria, dengue, dysentery and the diplomatic service?

Skipping to that 60th year again, what did living among the Mormons in Salt Lake City make me?

And Vermont, how has Vermont changed me, getting in its whacks every summer?

Were places the important things? Events? People? And what of love? And sons? And no daughters?

Can I find out if I examine the past? Will I have time? HURRY!

Getting Older

Why do I keep reminding myself that I'm over seventy?

I do my exercises every morning. "Pretty good for someone over seventy," I tell myself.

I think about going to that women's group that's forming next week. "Oh, what would they say if they saw someone my age coming in the door?"

I pick up a magazine. "Why am I reading CQ? I should be reading **Modern Maturity**!"

I pick up my clipboard and pen. "Well, now I'm over seventy I can't expect to write as well as I did."

Why do I clip my own wings?

Getting Older

The other day it occurred to me that the true "I" (for whom I have no accurate designation) has no sex. If there is something about me that survives death – as I believe – then that spirit . . . idea . . . entity . . . essence . . . will have no sex.

Sex is bestowed upon us when we receive our bodies, and thereafter our lives are completely conditioned by this arbitrary attribute; our given names, our clothes, our occupations, our physical weaknesses and our strengths are decided by our sex.

And I have been hobbled all my life simply because I was put into a woman's body.

How can it have taken me seventy-off years to discover this? Everyone else must know it – and ignore it.

Why, they won't even permit the minimal recognition of women's equality proposed by ERA!

Getting Older

Who was it – Colette? – who said she was trapped inside an aging body, looking out?

Though this bitter remark can't be fully understood until it is experienced, every person feels it as he gets older. My mother used to say, almost angrily, "I don't feel any older than when I was a young girl. I'm still a young girl inside!"

Hearing this, I used to think that it was sad that she felt she hadn't grown, sad she was "still a young girl" at eighty and then at ninety. At ninety my mother was still flirting coquettishly with old friends, with her sons-in-law, even with her grandsons. She would mock-modestly drop her wrinkled eyelids over her glowing eyes, then look up archly. "You're a terrible flatterer!" she would say, smiling. I would wince, watching.

And I also remember how a British friend raised her eyebrows at a passing American who, though no longer young, was wearing a short plaid skirt and a dark-blue sweater with a little white collar. "Mutton dressed as lamb," sniffed Beatrice.

I take off my glasses before I wash my face and do my hair. Without my glasses, I don't look too frightful. But when I remember my mother's illusions and Beatrice's "mutton," I put on my glasses and go to look at myself in the mirror. ▪

Old Isn't a Problem

by John L. McKnight

The United States is finally becoming a caring country. Shocked by assassinations, Viet Nam, Watergate and "stagflation" our people have turned to caring as the one ideal that cannot be corrupted.

Young people flock to schools of medicine, law, social work and urban planning. In spite of Proposition 13, two-thirds of our people derive their income from delivering services that are mainly caring.

The American caring that is growing most rapidly is service to the old. Our aging population is increasing so rapidly that a caring society can no longer ignore them. Lawyers, doctors, social workers, psychiatrists, physical therapists, counsellors and housing officials are now directing their care and concern to the old.

Concern for the elderly has resulted in an increasing professionalization of those who care for the old. This professional concern was expressed by the title of a recent conference convened by a major mid-western university: "Frontiers In Aging: Life Extension." The 700 participants were caring professionals from all the disciplines that help the aging.

Having been asked to speak to this group, I immediately consulted my mother-in-law. She is 81 years of age, comes from a Lithuanian background and lives in an apartment near our home.

We call my mother-in-law Old Grandma. She likes that name because she believes it makes her an authority.

When I told her that a conference called "Frontiers in Aging: Life Extension" was about her, she shook her head. She couldn't imagine they were talking about her because their language is of a different order than the words that Old Grandma knows.

Words like "frontiers," "aging" and "extension" are about *going, becoming* and *moving forward*. Old Grandma doesn't think those words relate to her life. To her, old is *being*. When Old Grandma says "old," it isn't good or bad. "Old" is like saying she's a woman. It is a condition, a state. To her, old is something that is not associated with problems. A problem is how to get the janitor to get the steam heat up to the right temperature. But old isn't a problem.

For Old Grandma, old is:

. . . finally knowing what is important.

. . . when you are, rather than when you are becoming.

. . . knowing about pain rather than fearing it.

. . . being able to gain more pleasure from memory than from prospect.

. . . when doctors become impotent and powerless.

. . . when satisfaction depends less and less on consumption.

. . . using the strength that a good life has stored for you.

. . . enjoying the deference.

. . . worrying about irrelevance.

Old Grandma's "old" cannot be counted. Therefore, people who count things will never know about her old. They are trapped by the tools of counting. The economists, social scientists, census takers and actuaries are closed out of her world because they can't count what counts to her.

Old Grandma wonders about the problem of people who have a conference on "old." She thinks that there is a problem with people who think old is a problem. ■

John McKnight is Associate Director of the Center for Urban Affairs at Northwestern University, Evanston, Illinois.

–SB

Comprehensive Guide to Board Wargaming
Wargame Design

The "Dungeons & Dragons" phenomenon reported on page 125 owes much of its origin to the bloom of interest this decade in board wargames. **Wargame Design,** ***from a headquarters of such matters –*** **Strategy & Tactics Magazine** ***– gives sufficient internal history and technique to make any game player into a game maker.*** **The Comprehensive Guide,** ***from British gamesmaster Nicholas Palmer, gives a fine overall working introduction to the subject, including a comprehensive evaluation of all the games published by 1977.***

–SB

The Comprehensive Guide to Board Wargaming
Nicholas Palmer
1977; 223 pp.
$12.50 postpaid
from:
Hippocrene Books, Inc.
171 Madison Ave.
New York, NY 10016

Wargame Design
(The History, Production, and Use of Conflict Simulation Games)
Strategy & Tactics Staff
Study No. 2
1977; 186 pp.
$9.95 postpaid

from:
Simulations Publications, Inc.
257 Park Ave., S.
New York, NY 10010

Helping Children Overcome Learning Difficulties

An important and useful book for anyone involved with teaching or raising children. It is written for the parent whose child is in difficulties at school, but it could serve as a guide for teaching any child the necessary prerequisite skills as well as the basics of reading, writing and arithmetic, whether to help him catch up to his peers or to prepare a younger child for school.

The first section provides various tests to assess the child's level of perceptual and motor skills. How completely a parent or teacher employs these tests would depend on the severity of a child's problem, but the section is valuable in pointing out that a child's learning problems most commonly result from his inability — for whatever reason — to perceive or perform the necessary antecedents to abstract learning: for example, one cannot learn to identify alphabetical symbols without some experience identifying and interpreting visual information such as patterns, designs, etc. Most important about this section, indeed about the whole book, is that except for a brief discussion of possible physical disabilities, Rosner deliberately dismisses the question of how a child's difficulties arose and goes directly to the cure: teaching him the skills he lacks for learning.

The second section gives specific instructions for teaching a child whatever skills you have discovered he lacks. I cannot assess the arithmetic part of this section, as none of the children I've taught have had difficulties with math, but the reading and writing parts are excellent indeed, following in many particulars the very procedures I have found to be most successful. (Here I must mention one most important point I wish Rosner had emphasized more: that reading and writing are forms of communication, and a child who has not been encouraged to communicate his experiences and thoughts or to participate in the communication of others, will not be much motivated to master the complexities of symbolic communication. At least half of "teaching" is listening and caring; for many children with "learning difficulties," simply encountering someone who listens and truly cares what they have to say is a turning point in their education, if not in their lives.)

The third section, "Prevention," should be of interest to anyone with a preschool child. It offers activities, games and play designed to provide a child with the necessary perceptual and motor skills he will need in preparation for school. The most significant aspect of this chapter is that in all of these activities the parent participates actively, so that learning becomes for the child not a task arbitrarily imposed but an adventure happily shared.

A cautionary note: teaching, especially teaching the child who already has a problem learning, cannot be a willy-nilly, casual affair. Consider attempting to learn to play the piano by practicing on random days, often not at all, and for random lengths of time: you would soon abandon your efforts and classify yourself as unmusical. Failure to teach a child leads to his classifying himself as stupid and abandoning all attempts to learn; it is worse than not trying to teach him at all. If you are unable to commit yourself to the daily time and undistracted attention teaching requires, find someone who can, and provide this book for guidance.

—Carol Van Strum

Helping Children Overcome Learning Difficulties
(A Step-by-Step Guide for Parents and Teachers)
Jerome Rosner
1975; 326 pp.

$12.50 postpaid
from:
Walker & Co.
720 Fifth Ave.
New York, NY 10019
or Whole Earth

To motivate your child, give him successful learning experiences. That is what the organization of the suggested activities attempts to provide. Do it on a regular basis — one that allows him to recognize that though every day in his life will not be a hugely successful one, plenty of them will be. Think of motivation as the child's willingness to risk his reputation. He has to trust you before he will do this — and he has to trust himself. Create conditions so that this can happen.

Records by Barry Louis Polisar

Hail, Barry Polisar! These records are without question the greatest reward reviewing for CQ has provided yet. Polisar is a W.C. Fields-Bob Dylan-Kinky Friedman-Tom Lehrer for kids. He is clown, minstrel, first class lunatic, the best kind of hero: outrageous, irreverent, disgusting and naughty, all under license of being irrepressibly funny. Kids (big and little) love him. After two of the records, the kids here caught on and started inventing their own "Barry Polestar" songs, making fun — and music — out of their most secret and appalling thoughts. Hooray.

Polisar not only writes his own songs and plays his own music to them, he makes his own records, designs his own album covers, and mails them to anyone who sends him $5.50 apiece for them. Well worth selling all your child psychology texts for: the world-shaking message of Barry's humor is that children are people, due all the respect, attention, and realio trulio civil courtesy that adults expect from each other.

—Carol Van Strum

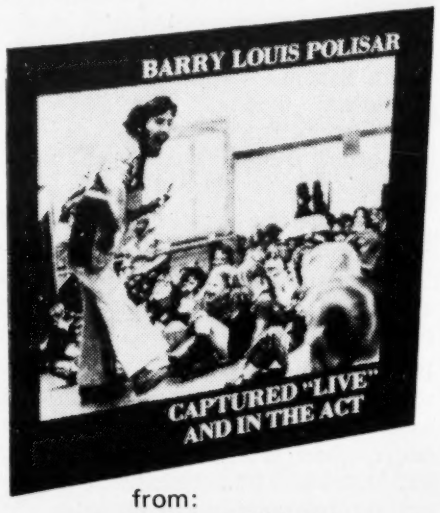
I Eat Kids
(And other songs for rebellious children)

My Brother Thinks He's a Banana
(And other provocative songs for children)

Naughty Songs for Boys and Girls

Barry Louis Polisar Captured "Live" and In the Act
(A Sampler)

$5.50 each postpaid



from:
Rainbow Morning
Music Alternatives
2121 Fairland Rd.
Silver Springs, MD 20904

You might not like her but don't knock her off her bike
Fighting is normal, but normal ain't right.
Don't put her in a bucket and drop her down a well
Or put her in the oven or try to sell
Her to the nice old man that lives up the street
Don't hit her with your hand or kick her with your feet . . .

—Never Cook Your Sister in a Frying Pan

•

My brother threw up on my stuffed toy bunny
You better not laugh 'cause it really isn't funny.
It was lying in my bed while I was sound asleep
But it could have been worse. Oh, it could have been me. . . .

So bunny now sits on my shelf at home
Next to the smelly toy telephone
And the dirty old bear with the stains and the spots
'Cause my little brother throws up a lot.

—My Brother Thinks He's a Banana

New Games Resource Catalog

From the New Games Foundation, the tree that grew out of our acorn New Games Tournament in 1973, comes a fine catalog. The best books of how-to and why-to, and plentious gear — boffers (foam sabres — $14), 6-foot Earthball ($250), loco balls ($5.95), smashballs ($8), all balls ($5). Invigorate a summer, enthuse a school.

—SB

New Games Resource Catalog
(A Playful Guide to Literature, Games Equipment and Materials)
Spring 1979; 20 pp.

$1.00 postpaid
from:
New Games Foundation
P.O. Box 7901
San Francisco, CA 94120

Business

Disney sues O'Neill, Brand, and POINT

The thousand-foot mouse automaton turns slowly but reliably. After months of silence in response to Dan O'Neill's "Mouse Liberation Front Communique No. 1" in the last **CQ** *(Spring '79), Walt Disney Productions charged Dan, me, and POINT Foundation with criminal and civil contempt of court.*

If convicted we face fines of up to $10,000 (each), our own and Disney's court costs, and jail sentences possibly up to six months. Represented by Larry Klein, and advised by Bob Gnaizda of Public Advocates, we are fighting the issue. So is Dan with his new lawyer John Keker.

In mid-June we are sending the following letter to the President of Walt Disney and simultaneously publishing it in a half-page ad in **Variety**.

—SB

Donn Tatum
President
Walt Disney Productions
500 South Buena Vista Street
Burbank, California 91521

Dear Mr. Tatum,

Your organization has charged cartoonist Dan O'Neill, myself, and my magazine The CoEvolution Quarterly with criminal contempt of court.

If you are successful in court, O'Neill and I face fines of up to $10,000 and jail sentences possibly as great as six months, as well as payment of your court costs. But even if I win in court, which is a good possibility, my own legal fees of $15,000 - $25,000 (twice that if there are appeals) could put my magazine out of business.

POINT, the non-profit foundation which publishes CoEvolution, had money once — the cash surplus from the success of my Whole Earth Catalog. Those funds were donated to various environmental and community good works years ago. POINT and CoEvolution barely break even from year to year. Check it out with the financial report we print in every issue.

Your suit threatens CoEvolution's existence, win or lose. From here, it looks like intimidation.

For what? For parodying Mickey Mouse. American presidents are not immune from parody; why should commercially created mythic figures be immune? Mickey is big, I grant you and congratulate you — add my greeting to Mickey's 50th Birthday Party. And bigness draws parody. Be flattered by it.

Dan O'Neill's four-page comic strip in the Spring 1979 CoEvolution, "Mouse Liberation Front Communique No. 1," comments incisively upon the recent Supreme Court ruling in your favor and against O'Neill. The Supreme Court let stand a lower court finding that Dan O'Neill had violated Disney's copyright eight years ago with a pair of satirical comic books called "Air Pirates Funnies."

Dan's strip in CoEvolution, I'm sure you'll agree, is in good taste, good humor, and rather insightful. His "Mickey Mouse" comments on yours, perhaps unwelcomely, but surely in no way that damages Walt Disney Productions. Also surely no one could mistake O'Neill's strip for one of yours, a confusion that would be necessary to raise a copyright question.

You were chagrined by "Mouse Liberation Front Communique No. 1" and sought remedy with the court. You should have sought it with us. I'll offer it anyway: I'm reserving equal space (four pages) in the Fall CoEvolution for Disney to reply to O'Neill or do whatever it wants. If Disney parodies us, I would not mind, or sue. Parody, as part of Free Speech, is a fragile right, all too susceptible to overzealous suing.

The criminal contempt charge is to be heard in Judge Wollenberg's court in San Francisco at 9:30 a.m. on June 27. If you decided to withdraw charges before then, that would be lovely. But my invitation to you to reply in CoEvolution, to the same audience that O'Neill offended you to, stands regardless. If you send nothing, I'll print four blank pages.

How would Mickey handle a situation like this? He'd come up with some goodhearted solution no doubt.

Stewart Brand
Editor

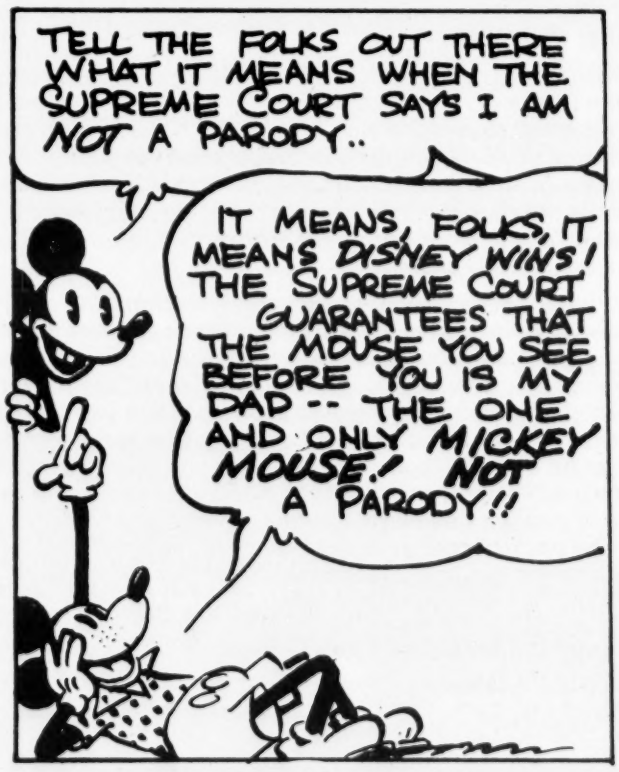
Truth in by-lining

I've never been personally political or controversial, despite various elected and imprisoned associates, so it was rather a pleasant jolt to read a whole disapproving editorial about my metric activities in the Los Angeles **Times** *this winter. "We are hard put," it said, "to understand Gov. Brown's appointment of environmentalist Stewart Brand to the California Metric Conversion Council. Brand . . . is against the metric system, but will be serving on a panel whose one purpose is to explain its advantages . . His presence on the Council mocks its purpose."*

It so happened that at the time one of the L.A. **Times** *editors was after us to provide them with people and material for the* **Times** *Op Ed Page. So I then sent a brief anti-metric essay, and after some back-and-forth they published it. Well, sort of it.*

The published version was so different from what I wrote that people here thought that **CQ** *readers might be interested to inspect the difference and consider how much of what they read in the papers under someone's by-line has been editorially transformed. Mind you, the editor did check her version with me, and I bit my tongue and let it go through — for crass political reasons. She even let me reinstate the references to the scientific usefulness of metric and the British experience with two-system chaos — lone facts amid the opinion.*

All this alarms me in one way. It's an issue like false advertising. I would like some assurance when I see a by-line that that person really is the author, that they haven't been edited unrecognizably, and that they haven't been ghostwritten. (Exposing and reforming current ghostwriting practices would transform politics — for the better, I believe. If you can send us something to help that process, I'll consider it for publication — unmangled.)



A panel from the alleged criminal strip.

Original version

The Brief Against "Voluntary" Metric Conversion

by Stewart Brand

The metric system is not the problem. Conversion is the problem.

Metric is fine in its place. It's handy for scientists who have a lot of abstract multiplying to do, and it's convenient for technicians who work with minute quantities of fluid and weight – chemists, doctors, and such. They already use metric in their professional lives – no conversion is necessary.

What is not reported in the pro-metric literature is that the "scientific" metric system is not used or even encouraged by scientists in their daily life at home.

For good reason. The present American system – inches, feet, cups, quarts, pounds, miles, etc. – is a highly evolved measuring system for the human hand and eye to work with in daily use – cooking, crafts, home maintenance, travel, and so forth. The system shows its genius both in the comfortable way it handles fractions and in its physically convenient whole units. Almost all the working fractions are halves, thirds, and quarters – far easier to "eyeball" and imagine than the tenths and fifths of metric. Which is clearer in your mind – 0.125 or 1/8th?

One of the touted advantages of mass conversion to metric is that "an estimated 25% of mathematic instruction time will be saved because the decimal system is easier to learn than fractions." Good luck living without fractions, kids. Don't look for work in stocks and bonds, where even our decimal money system is reported in eighths.

The comparative advantages of the systems could be discussed at length, but there are two far more important issues. 1) The American people don't want metric. 2) The present "voluntary" approach to conversion is structurally guaranteed to fail.

1) A recent (1977) Gallup Poll indicated that 45% of the American populace is against conversion to metric, 26% unaware of it, 24% for it, and 5% with no opinion. So why is our democratic representative government pushing metric on an unwilling, uninterested citizenry? The major reason given is that other countries have metric, so it would help our overseas trade if we did. As a businessman myself I find it quaint that government feels it must help business detect where its interest lies. Some companies who deal overseas package their goods metrically, some don't, depending on how they assess their markets. None I know of report any hardships either way.

(International standardization is no argument. Japanese nuts don't fit German bolts, and they're both metric. In fact there are a bewildering variety of metric threads and relatively few in the American standard system.)

The wicked majority. I've seen whole editorials comparing the conversion to metric with racial integration – the majority was against it but the general good required it. Indeed that's true where there's suffering and injustice – not exactly a problem in this case.

The political fact is that metric has a confident enthusiastic vocal minority in its favor and an inarticulate majority against it. Given this situation, the thing to do with metric is "sneak it in," according to Valerie Antoine, my colleague on the California Metric Conversion Council (a nice person, by the way).

2) The hitch is you can't sneak metric in. That's the present law, and it isn't working. Both the Federal Metric Conversion Act of 1975 and our new California law state that what we are to aid is the "voluntary conversion" to the metric system.

A recent (1978) two-year study by the General Accounting Office in Washington pointed up the fallacy of voluntary conversion. The supposed benefits of metric really obtain only when you're totally on the system. Everyone, pro and con, agrees that constant daily converting from one system to the other is a disaster, even in education. But that's exactly the situation we're headed for with our present piecemeal, confused approach. Look what happened in England, where a far more enthusiastic conversion than ours stalled halfway along in semi-permanent chaos.

The costs of conversion have been estimated as high as $100 billion (GAO Report). We're talking about changing our

L.A. Times version

Metric Fails to Measure Up, So Why Stick Us With It?

BY STEWART BRAND

Several months ago, Gov. Brown appointed me to represent consumers as a public member of the California Metric Conversion Council. The appointment drew some criticism, since I have been characterized as a foe of metric measure.

Actually, I think that the metric system has merit; it's conversion that's the problem – such a crucial problem, in fact, that it is important that the point of view that I espouse be represented on a body whose official "role statement" charges it to "act as a public forum to insure that the concerns of all interested parties are given full consideration." Nevertheless, since I originally opposed the formation of the $92,000-a-year council, I serve on it at my own expense.

There's no doubt that metric measure is convenient for scientists and technicians, who must deal with large abstract multiples and minute measures of fluid and weight – but they already use it in their professional lives.

What is seldom reported in pro-metric literature, however, is that the so-called "scientific" metric system is not used, or even encouraged, by scientists in their daily lives – and for good reason. The present American system – of inches, feet, cups, quarts, pounds, miles – is a highly evolved measuring system, easy for the human hand and eye and ideally suited for cooking, crafts, home maintenance, travel and so forth.

The system demonstrates its genius both in the comfortable way in which it handles fractions and in its physically convenient whole units. Almost all the working fractions are halves, thirds and quarters – far easier to "eyeball" and imagine than metric's necessary tenths and fifths. Which is clearer in your mind – 0.125 or 1/8?

The comparative advantage of the two systems could be discussed at length, but there are two far more important issues. First, the American people don't want metric, and, second, the present "voluntary" approach to conversion, mandated by the Metric Conversion Act of 1975, is structurally guaranteed to fail.

A Gallup poll conducted in 1977 indicated that 45% of the American populace is against conversion to metric, 26% is unaware of it, 24% is for it, and 5% has no opinion. Why, then, is our democratic, representative government pushing metric on an unwilling, uninterested citizenry? The major reason given is that other countries use the metric system, and so adopting it would help our overseas trade. As a businessman, I find it curious that government feels that it must help business detect where its interest lies. Some companies that deal overseas package their goods metrically, and some don't – depending on how they assess their markets. None that I know of report any hardship either way.

Thus, international "standardization" is no argument. Japanese nuts don't fit German bolts, and they're both metric. In fact, there is a bewildering variety of metric threads, and relatively few in the standard U.S. system.

I've read editorials comparing the conversion to metric with racial integration: The majority may be against it, but the general good requires it. That logic stands up where there's suffering and injustice – hardly a problem in this case.

The political fact is that metric has a confident vocal majority opposing it. Given this situation, the thing to do, according to Valerie Antoine, my colleague on the California Metric Conversion Council, is to "sneak" metric in.

A recent two-year study conducted by the General Accounting Office in Washington pointed up the fallacy of voluntary conversion. Everyone agrees that constant daily converting from one system to the other would be a disaster, even in education. Yet that's exactly the situation that we're headed for with our piecemeal, confused approach. England's conversion attempt – more enthusiastic than ours – remains stalled in two-system chaos.

Our equipment, our materials, our tools, our texts, our laws, our customs, our speech, our literature, our culture – all are expressed with excellent efficiency in feet, pounds, miles per hour and degrees Fahrenheit. This is not nostalgia; it's the working apparatus of a society, deeply embedded in every

(BRAND continued)

language, exactly as if a group of Esperanto enthusiasts had convinced the government that it ought to promulgate that "rational" language and phase out archaic English. Our equipment, our materials, our tools, our texts, our laws, our customs, our speech, our literature, our culture are expressed with excellent efficiency in feet, pounds, miles per hour, and degrees Fahrenheit. This is not nostalgia, it's the working apparatus of a society, deeply embedded in every detail of its working.

When something is that universal and functioning, you either convert or you don't. I am proposing that the Federal government, or the state of California if it wants to play bellwether, formally consider a "hard" mandatory conversion to metric – set a date and do the deed, all at once. That should focus public attention properly, and on a realistic program – either way it goes.

If the people decide they really want metric, fine. If not, then perhaps we can turn government's expensive attention to other areas where it can be useful instead of a nuisance. . . .

Postscript. My presence on the Metric Conversion Council has been questioned. I serve several functions. One responds to the first requirement on the Council's Role Statement – that we "act as a public forum to ensure that the concerns of all interested parties are given full consideration." Also I was nominated and appointed specifically to represent consumers on the Council – a group which opposes conversion to metric, both on grounds of colossal inconvenience and commercial ripoff (the conversion of the wine business to metric was accompanied by an 11% rise in unit price).* Finally, I am one of many public members appointed by Governor Brown to various state boards and commissions to act as a check and watchdog on special interests in government. Because I oppose the existence of the $92,000/year Metric Conversion Council, I serve on it at my own expense.

If you would like the Metric Conversion Council to hear your views on metric – pro, con, or informative – write to me at the Council's office – 8500 Fruitridge Rd., Sacramento, CA 95826. ■

**Metric wine in California costs 20% extra, I learned at a Council meeting after this piece was written. Both of these bottles from the same liquor store cost $2.39. The wine is identical, the volume isn't, by the amount shown when the metric bottle is emptied into the customary. That's the difference between 3 liters and 1 gallon. Shame on Mission Cellars.*

(L.A. Times continued)

detail of its life. Changing it now is about as reasonable as abandoning "archaic" English for the more "sensible" language of Esperanto.

And then there is the enormous cost of conversion, variously estimated at $10 billion to $100 billion.

With something as universal and pervasive as weights and measurements, you either convert or you don't. Therefore, the federal government or the state of California, if it wants to play bellwether – should formally consider *mandatory* conversion to metric – set a date and do the deed, all at once. That kind of action would properly focus public attention on adopting a realistic program.

Then, if the people decide that they really want metric, fine. If not, perhaps we can turn government's attention to areas in which it can be a help instead of a nuisance. ■

Some time after the **Times** *piece appeared, the* **U.S. Metric Association Newsletter** *reported, "Controversy still centers on the appointment of Stewart Brand to the Council because of his anti-metric views and obstructionist tactics on the Council . . . On March 15 Brand had a 43 cm anti-metric column in the Los Angeles* **Times** *to which seven writers responded in the* **Times***' letter column pointing out the fallacy of his views."*

Right. Seven letters opposed were printed. None in favor, though some were submitted, one by Bob Hopkins, the editor of **American Metric Journal**, *who likes to expose the behavior of his fellow metricators. Now that's editing.*

–SB

Gossip

One of **CQ***'s contributors, Ira Einhorn ("A Disturbing Communique," Winter '77-'78) has been indicted for murder in Philadelphia. His girlfriend Holly disappeared in 1977 (it must have been shortly after he wrote the Communique). Her parents were suspicious of Einhorn and put a private detective on the case. This Spring, after neighbors complained of stains on their ceiling and bad odors, Holly's dismembered remains were found in Einhorn's closet.*

The editors of that issue of **CQ**, *which condemned television on every count from medical to cultural, continue their career trend. Larry Lee went from radio into television last summer, and now his co-editor Scoop Nisker is co-hosting an alternative TV show called VIDEOWEST. Anne Herbert says, "You always love the one you hate." Freud says, "Denial precedes acceptance."*

CQ *medical editor Tom Ferguson is undergoing a media flash these days. He and his magazine* **Medical Self-Care** *have been featured in everything from the Los Angeles* **Times** *to CBS'* **60 Minutes**.

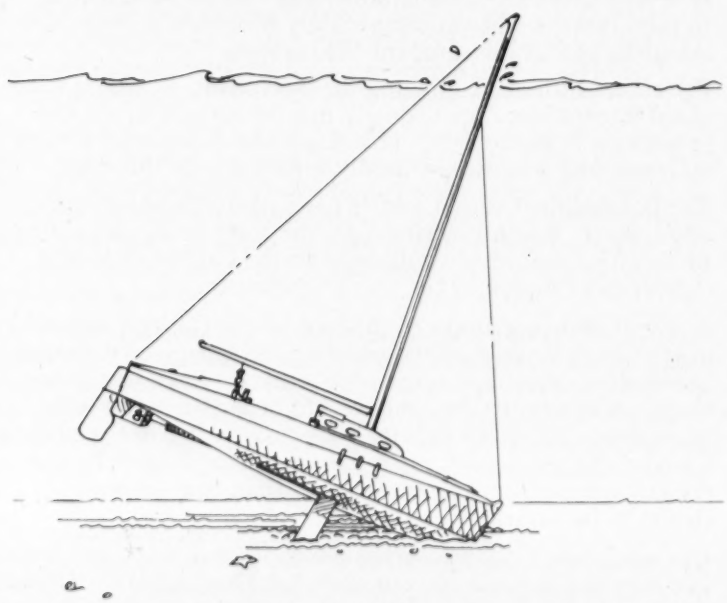
Meanwhile the medical siege among **CQ** *staff continues with Susan Goodrick being hospitalized briefly with abdominal problems, but she's better, and we're glad. Production without a production manager is no fun.*

Circulation's Isabella Kirkland, who is mainly a fine artist (presently doing exquisite miniatures) spent some dazzled weeks in Manhattan and is considering moving there. Would some San Francisco galleries please catch on and prevent this?

Office manager Andrea Sharp is buying a house. Dick Fugett recently bought one. The rest of us renters in the office are nervous, considering such behavior a sign of age.

Faithful gossip readers will recall that I left my Uffa Fox-designed 26-foot sloop Brit in the highly capable hands of Jon Wilson, editor of **Wooden Boat**, *for the winter in Maine. This spring she sank at her mooring, leaving only a disconsolate two feet of mast showing above high tide. Jon, highly embarrassed, says that suddenly he is hearing from dozens of other people whose boats sank and who only admit it to each other. Brit does resemble a submarine.*

–SB



WoodenBoat

CoEvolution Quarterly — Summer '79 Financial Report

EXPENSES	Feb.,Mar.,Apr. (Predicted)	Feb.,Mar.,Apr. (Actual)	May,Jun.,Jul. (Prediction)
Salaries and fees			
Office	$ 14,500	$ 17,788.62	$ 17,000
Production	6,000	6,276.22	6,000
Editors	7,500	7,832.07	8,000
Contributors	3,300	2,995.00	5,500
Office rental, materials, etc.	12,000	11,382.01	12,000
Phone	900	834.82	850
Promotion	2,000	3,419.53	4,000
Printing	21,600 (50,000 copies)	23,534.45 (50,000 copies)	28,550 (50,000 copies)
Subscription process & mail	16,500	15,950.79	16,000
Shipping	1,200	1,463.23	1,700
Business Reply	1,500	350.00	350
Refunds	400	302.98	300
Total	$ 87,400	$ 92,129.72	$100,250
		Unit Cost (printing): $0.47 Unit Cost (total): $1.84	
INCOME			
Subscriptions, gifts, and renewals	$ 60,000	$ 53,000.90	$ 52,000
Retaining and Sustaining	4,000	1,860.00	4,000
Back Issues	4,000	3,906.75	4,000
Distribution	20,000	19,386.23	20,000
Total	$ 88,000	$ 78,153.88	$ 80,000
NET GAIN OR (LOSS)	$ 600	($ 13,975.84)	($ 20,250)

POINT Balance Statement
30 April 1979

ASSETS	
Cash in bank	$ 41,533.86
Investments	79,039.72
Accounts Receivable	
Distributors	40,383.58
INVENTORY	
Back issues, CQ	128,171.22
Maps, posters,	
II Cybernetic Frontiers	1,186.00
Mail-order LWEC & WEE	4,086.00
Mail-order CQ Books	2,318.75
Penguin Inventory	
CATALOG ($1.73)	13,653.16
EPILOG ($1.01)	20,894.88
Pomegranate inventory	
Maps & Posters	9,300.00
T-Shirts	1,898.32
LIABILITIES	
Accounts payable	—
Deferred SB Salary	31,701.57
Subscription liability	245,925.00

POINT Financial Report

CQ (detail above)	PAST QUARTER Feb.,Mar.,Apr. 1979
INCOME	$ 78,153.88
EXPENSE	92,129.72
CQ Books	
INCOME	
Penguin-Viking	—
Direct mail-order	2,102.80
EXPENSE	
Production & Mail-Order Supplies	9,166.33
Catalog & Epilog	
INCOME	
Penguin-Viking	4,391.25
Direct Mail-Order	1,653.80
EXPENSE	
Production & Mail-Order Supplies	394.38
Maps, Posters, II Cybernetic Frontiers	
INCOME	4,244.70
EXPENSE	1,133.08
T-shirts	
INCOME	3,051.50
EXPENSES	2,700.00
Miscellaneous	
INCOME	
Point, Miscellaneous	25.00
EXPENSE	
Point, Miscellaneous	2,186.00
Index	303.75
TOTALS	
INCOME	$ 93,622.93
EXPENSE	$108,013.26
NET GAIN OR (LOSS)	($ 14,390.33)

'Or Whole Earth': *That phrase under the access of an item in the CQ means that you can mail order it from:*

Whole Earth Truck Store, c/o Zen Center
300 Page Street
San Francisco, CA 94102

Note: Please add $ .75 to any order to cover shipping and handling. Add 10% to foreign orders. Inquire for UPS or Air Mail postage charges. Anything other than items so listed — orders for books, maps, etc. published by CQ, or letters, material for the magazine, subscriptions, contributions, complaints — should be sent to:

The CoEvolution Quarterly
Box 428
Sausalito, CA 94965

(BRAND continued)

language, exactly as if a group of Esperanto enthusiasts had convinced the government that it ought to promulgate that "rational" language and phase out archaic English. Our equipment, our materials, our tools, our texts, our laws, our customs, our speech, our literature, our culture are expressed with excellent efficiency in feet, pounds, miles per hour, and degrees Fahrenheit. This is not nostalgia, it's the working apparatus of a society, deeply embedded in every detail of its working.

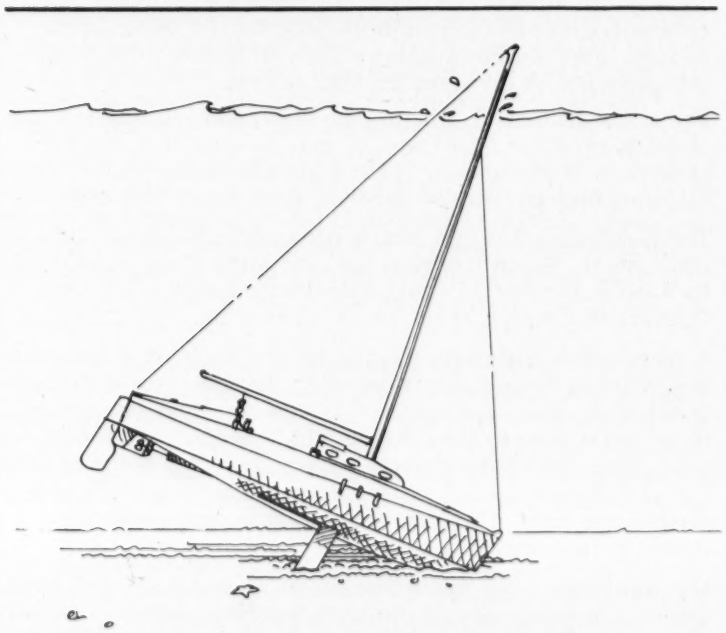
When something is that universal and functioning, you either convert or you don't. I am proposing that the Federal government, or the state of California if it wants to play bellwether, formally consider a "hard" mandatory conversion to metric – set a date and do the deed, all at once. That should focus public attention properly, and on a realistic program – either way it goes.

If the people decide they really want metric, fine. If not, then perhaps we can turn government's expensive attention to other areas where it can be useful instead of a nuisance. . . .

Postscript. My presence on the Metric Conversion Council has been questioned. I serve several functions. One responds to the first requirement on the Council's Role Statement – that we "act as a public forum to ensure that the concerns of all interested parties are given full consideration." Also I was nominated and appointed specifically to represent consumers on the Council – a group which opposes conversion to metric, both on grounds of colossal inconvenience and commercial ripoff (the conversion of the wine business to metric was accompanied by an 11% rise in unit price).* Finally, I am one of many public members appointed by Governor Brown to various state boards and commissions to act as a check and watchdog on special interests in government. Because I oppose the existence of the $92,000/year Metric Conversion Council, I serve on it at my own expense.

If you would like the Metric Conversion Council to hear your views on metric – pro, con, or informative – write to me at the Council's office – 8500 Fruitridge Rd., Sacramento, CA 95826. ■

**Metric wine in California costs 20% extra, I learned at a Council meeting after this piece was written. Both of these bottles from the same liquor store cost $2.39. The wine is identical, the volume isn't, by the amount shown when the metric bottle is emptied into the customary. That's the difference between 3 liters and 1 gallon. Shame on Mission Cellars.*



WoodenBoat

(L.A. Times continued)

detail of its life. Changing it now is about as reasonable as abandoning "archaic" English for the more "sensible" language of Esperanto.

And then there is the enormous cost of conversion, variously estimated at $10 billion to $100 billion.

With something as universal and pervasive as weights and measurements, you either convert or you don't. Therefore, the federal government or the state of California, if it wants to play bellwether – should formally consider *mandatory* conversion to metric – set a date and do the deed, all at once. That kind of action would properly focus public attention on adopting a realistic program.

Then, if the people decide that they really want metric, fine. If not, perhaps we can turn government's attention to areas in which it can be a help instead of a nuisance. ■

Some time after the **Times** *piece appeared, the* **U.S. Metric Association Newsletter** *reported, "Controversy still centers on the appointment of Stewart Brand to the Council because of his anti-metric views and obstructionist tactics on the Council . . . On March 15 Brand had a 43 cm anti-metric column in the Los Angeles* **Times** *to which seven writers responded in the* **Times'** *letter column pointing out the fallacy of his views."*

Right. Seven letters opposed were printed. None in favor, though some were submitted, one by Bob Hopkins, the editor of **American Metric Journal**, *who likes to expose the behavior of his fellow metricators. Now that's editing.*

–SB

Gossip

One of **CQ***'s contributors, Ira Einhorn ("A Disturbing Communique," Winter '77-'78) has been indicted for murder in Philadelphia. His girlfriend Holly disappeared in 1977 (it must have been shortly after he wrote the Communique). Her parents were suspicious of Einhorn and put a private detective on the case. This Spring, after neighbors complained of stains on their ceiling and bad odors, Holly's dismembered remains were found in Einhorn's closet.*

The editors of that issue of **CQ**, *which condemned television on every count from medical to cultural, continue their career trend. Larry Lee went from radio into television last summer, and now his co-editor Scoop Nisker is co-hosting an alternative TV show called VIDEOWEST. Anne Herbert says, "You always love the one you hate." Freud says, "Denial precedes acceptance."*

CQ *medical editor Tom Ferguson is undergoing a media flash these days. He and his magazine* **Medical Self-Care** *have been featured in everything from the Los Angeles* **Times** *to CBS'* **60 Minutes**.

Meanwhile the medical siege among **CQ** *staff continues with Susan Goodrick being hospitalized briefly with abdominal problems, but she's better, and we're glad. Production without a production manager is no fun.*

Circulation's Isabella Kirkland, who is mainly a fine artist (presently doing exquisite miniatures) spent some dazzled weeks in Manhattan and is considering moving there. Would some San Francisco galleries please catch on and prevent this?

Office manager Andrea Sharp is buying a house. Dick Fugett recently bought one. The rest of us renters in the office are nervous, considering such behavior a sign of age.

Faithful gossip readers will recall that I left my Uffa Fox-designed 26-foot sloop Brit in the highly capable hands of Jon Wilson, editor of **Wooden Boat**, *for the winter in Maine. This spring she sank at her mooring, leaving only a disconsolate two feet of mast showing above high tide. Jon, highly embarrassed, says that suddenly he is hearing from dozens of other people whose boats sank and who only admit it to each other. Brit does resemble a submarine.*

–SB

CoEvolution Quarterly — Summer '79 Financial Report

EXPENSES	Feb.,Mar.,Apr. (Predicted)	Feb.,Mar.,Apr. (Actual)	May,Jun.,Jul. (Prediction)
Salaries and fees			
Office	$ 14,500	$ 17,788.62	$ 17,000
Production	6,000	6,276.22	6,000
Editors	7,500	7,832.07	8,000
Contributors	3,300	2,995.00	5,500
Office rental, materials, etc.	12,000	11,382.01	12,000
Phone	900	834.82	850
Promotion	2,000	3,419.53	4,000
Printing	21,600 (50,000 copies)	23,534.45 (50,000 copies)	28,550 (50,000 copies)
Subscription process & mail	16,500	15,950.79	16,000
Shipping	1,200	1,463.23	1,700
Business Reply	1,500	350.00	350
Refunds	400	302.98	300
Total	$ 87,400	$ 92,129.72	$100,250
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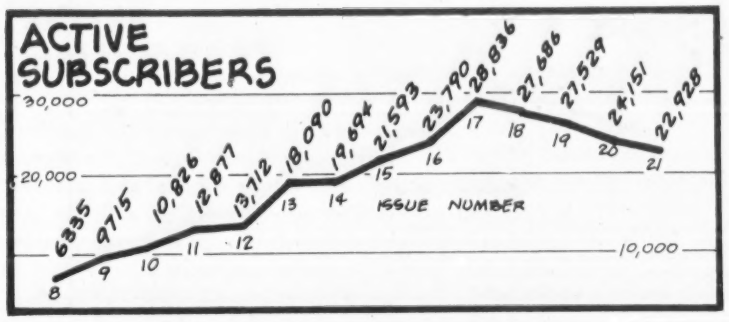

Worrisome CQ subscription trend

It's far from dire (we've been there before), but it's also far from comforting to see our subscriptions dwindling a bit. They are what keep us in business — newsstand and bookstore sales barely break even due to the (earned) 40% of cover price that goes to the vendor. We encourage retail sales (use the form attached to the envelope by the back cover to help new retailers find us) because that's one of the major ways we get new subscribers.

We do a modest amount of direct mail promotion — junk mail — but that's been diminishing in effect lately because everyone is doing it and "occupant" is overloaded.

Mainly it's readers who've kept us going, by renewing and by encouraging or giving **CQ** *to friends. We like your friends, and they seem to like us (the ones that aren't furious and insulted — hmm, try us on your enemies).*

Would it be self-serving to report that many **CQ** *subscribers are responding to inflation by subscribing for two years?*

—SB

Thank you

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Donna Boyd & Gene Combs
Lexington, Kentucky
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Robert Dunn
Scottsdale, Arizona
Captain Michael O. Johnson
Twentynine Palms, California
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Greg & Pat Williams
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and Four Anonymities

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T & M Bayard
Wilmington, DE
Mrs. Arthur Brand
Rockford, IL
Edmund G. Brown, Jr.*
Sacramento, CA
Mike Bunis
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Ross Dagata
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Ted Gosstyla
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Palmer Madden
Alamo, CA
Virginia Madden
Alamo, CA
McCoy Chiropractic Office
San Anselmo, CA
Norman Pease
Orinda, CA
Peter Pille
Transvaal, S. Africa
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Santa Barbara, CA
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and Two Anonymeese

**By virtue of returning payment for interview.*

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Brawley, CA
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Assistant Editor Anne Herbert

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Partial Contents of Past Issues *(Issues 2, 10, 11 & 14 also available, others not listed are Out of Print.)*

15 Fall 1977

Solar Water Heaters in California, 1891-1930 *Ken Butti and John Perlin*
The Wandervogel *John de Graaf*
The Ideas of Greenwich Village *Malcolm Cowley*
Sanctuary in Cuba *Huey P. Newton*
Havana Province, 1977 *Conn Nugent*
Neighborhood Preservation is an Ecology Issue *Stewart Brand*
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The Hawksbill Turtle *Kevin Stevenson*
Odd Bodkins *Dan O'Neill*
New Crops *Rosemary Menninger talking with Richard Felger*
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Two Dangling Animal Stories and a Heavy Bear Story *J.D. Smith*
The Custer Wolf *Patrick Holland*
Broken Circuits, Smoke and Fire *Judy Melvoin*
If the Spirits of the Dead Do Walk Among Us, Where D
They Spend Their Summer Vacations? *Robert Goldman*

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But First, A Word from Our Guest Editors *Larry Lee and Scoop Nisker*
The Mass Media and the Future of Desire *Gene Youngblood*
The Earth Gods vs. the Sky Gods: Publisats against the Oligoposat *Sol Yurick and Wes Thomas*
Getting into THE ACT *interview with Harry M. Shoosan III and Andrew J. Margeson by Robert Horvitz*
Four Arguments for the Elimination of Television *Jerry Mander*
Hypnotic Age Regression of a Television Addict *Paul Krassner*
Deprogramming the Media Mind or Turn Off, Tune Out and Drop On Over Some Time *Scoop Nisker*
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The Goose and the Gander Were Talking One Night *R. Crumb*
Ethical Technology *Michael J. Goc*
Buildings as Organisms *Day Chahroudi*
Mr. Boney Parts *Dan O'Neill*
A New Wolf *Rodney Sirois talking to Lynn Franklin and Ron Poitras*
Celebrations *photos selected by Minor White and Jonathan Green*
Yellow Diamonds *Malcolm Wells*
Ah, Firefighting *Randy Black*

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A Defence of Sacred Measures *John Michell*
Governor Brown at the Mental Hospitals *Orville Schell*
Cops Without Guns *Ken Kesey*
More Yellow Diamonds *Malcolm Wells*
Environmental Mutagens/Carcinogens *Bruce N. Ames*
Language, Thought, & Disease *W.D. Ellerbroek, M.D.*
The Nerds *R. Crumb*
Number is Different from Quantity *Gregory Bateson*
Biological Agriculture in Europe *Gil Friend*
The Coming of Spring 1977 *Robert Horvitz*
Botanic Architecture *Mark Primack*
Solar Water Heaters in Florida 1923-1978 *Ken Butti and John Perlin*
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I Was Armand Hammer *J. Baldwin*
Flo and the Sharks *Richard Baldasty*
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Reading for Running *Tom Ferguson*
The Mole Earth Joke Book *Mark Mitcham*
How to Use Road Kills *Douglas Elliot*
The Death and Resurrection of Old Blue *Charles Fox*
Clunker Bikes *Richard Nilsen*
On Story Telling *Carol Scott Van Strum*
Little Prigs & Sages *collected by Irving Weiss*
What Do You See Out of the Window You Look Out Of Most? *Anne Herbert*

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18 Summer 1978

The Pattern Which Connects *Gregory Bateson*
Everybody Else's Space Programs *James Oberg*
Private Enterprise in Space Via Staging Company *Christian O. Basler*
Astropollution *David Thompson*
Comments on Astropollution *Paul & Anne Ehrlich, Eric Drexler, Gerard O'Neill*
I Decide Who Goes to the Mental Hospital *Chip Barker*
Nobody Should Decide Who Goes to the Mental Hospital *Dr. Thomas Szasz talking with Gov. Jerry Brown and Dr. Lou Simpson*
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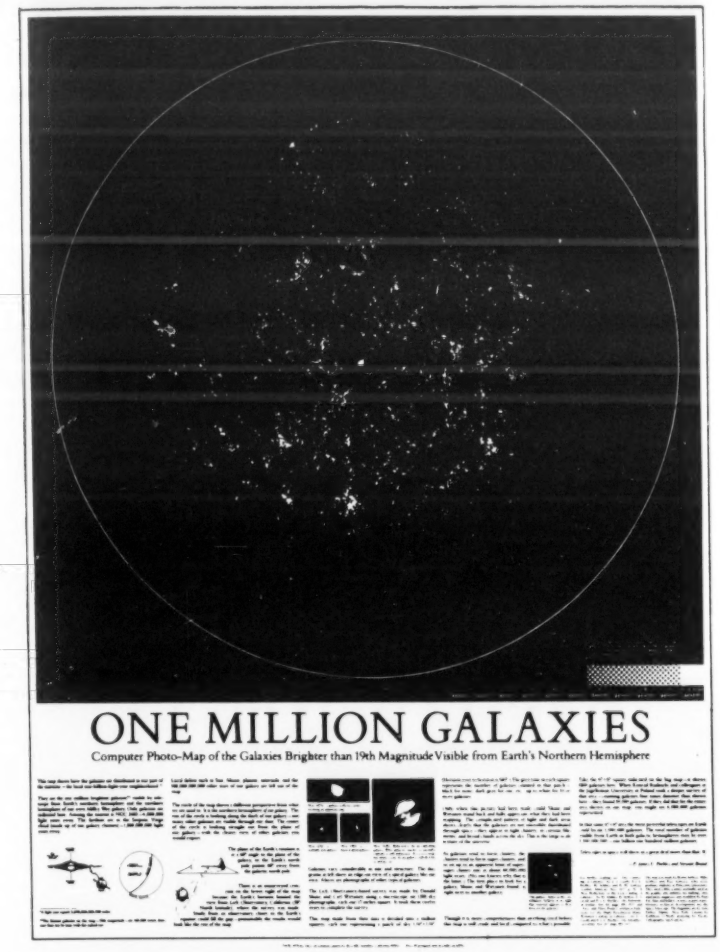

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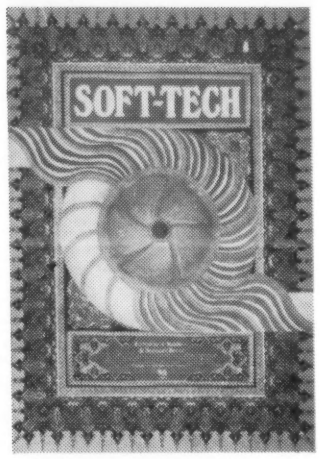

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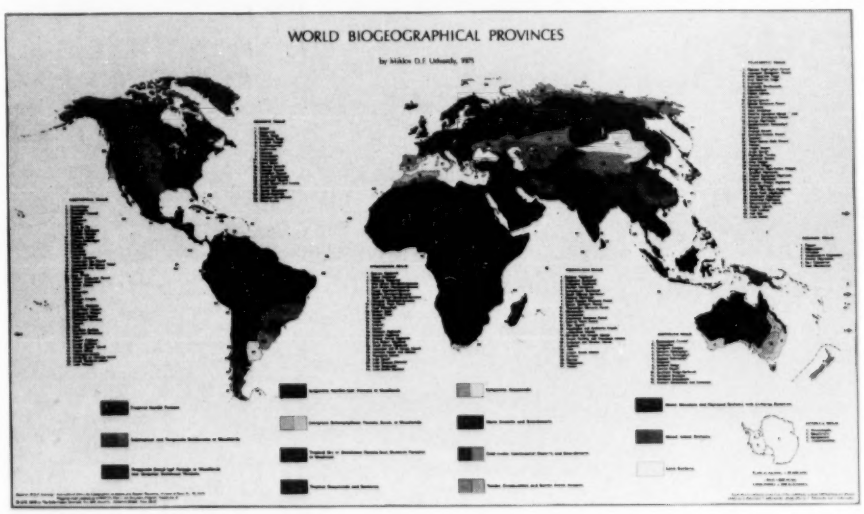

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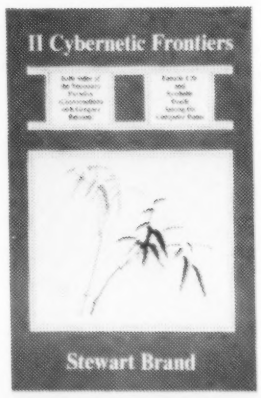
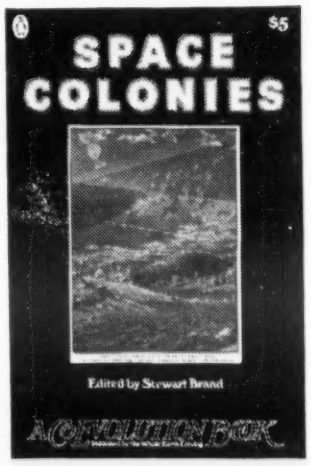
—SB





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